RISC user

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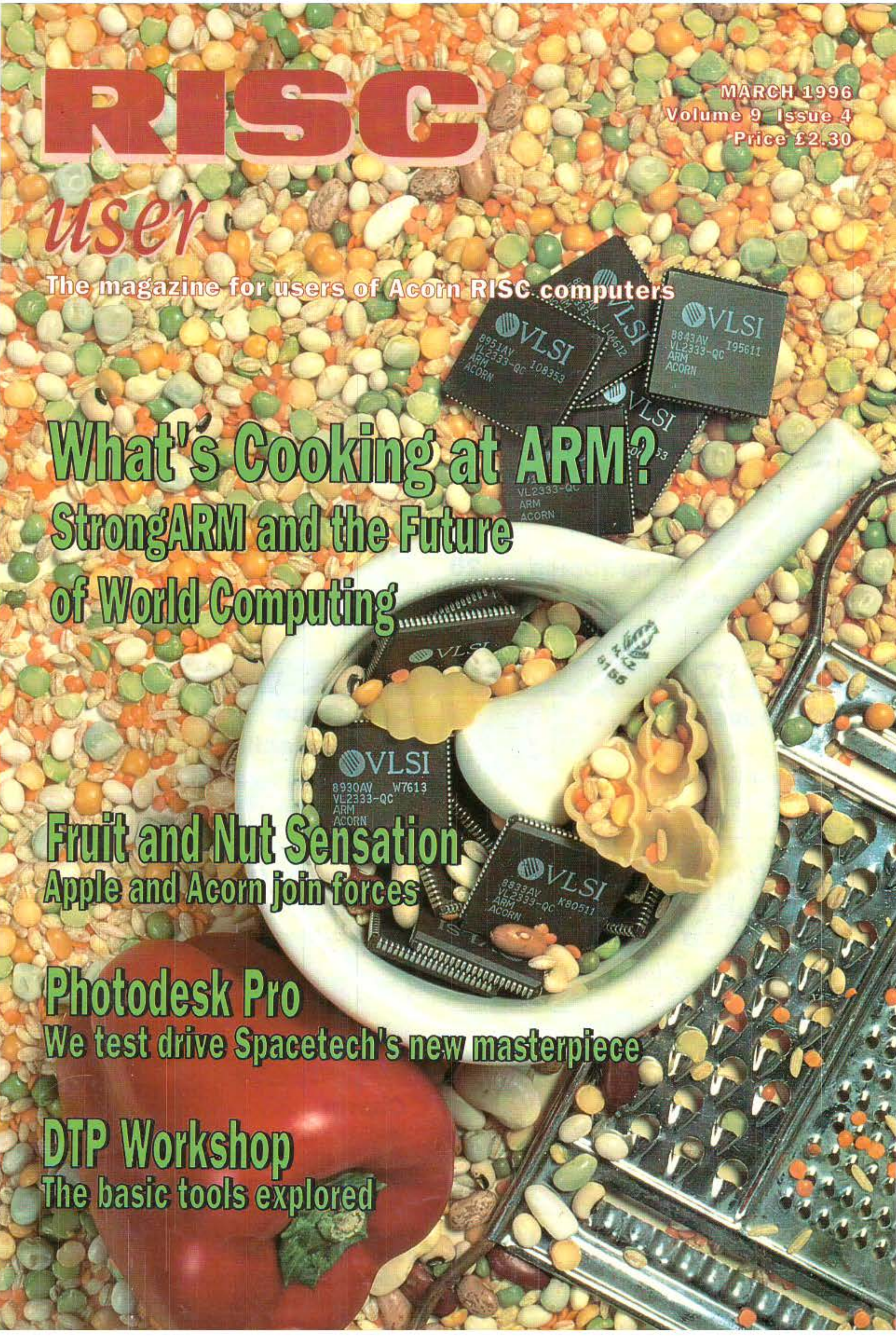
The magazine for users of Acorn RISC computers



What's Cooking at ARM?

StrongARM and the Future of World Computing

Fruit and Nut Sensation

Apple and Acorn join forces

Photodesk Pro

We test drive Spacetech's new masterpiece

DTP Workshop

The basic tools explored

THE MAGAZINE
FOR USERS OF
ACORN RISC
COMPUTERS

RISC user

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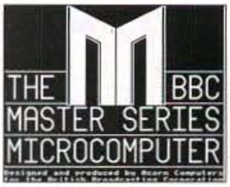

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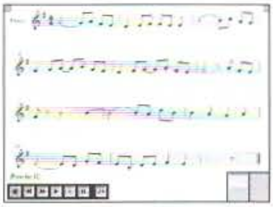

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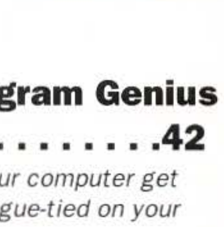

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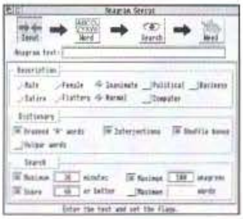

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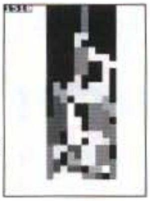

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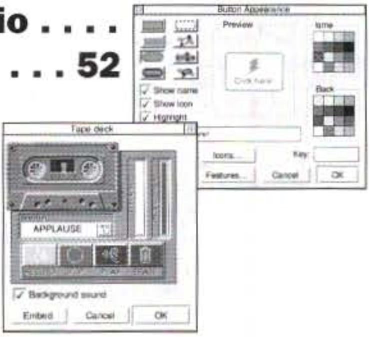

Front Cover Photography

Lee Calcraft

When the Risc PC was first announced, I was told that it would be as big a step up from the then-current Archimedes range as the Archimedes itself had been from the BBC Micro. Personally I felt that this comment was a bit unrealistic: certainly the Risc PC was, and is, a very fine machine indeed, and with its much enhanced graphics capabilities, in particular, it did represent the next generation of Acorn RISC machines. However, what it did not do was to supersede current Archimedes machines entirely; after all, it was only about 50% faster than the best of the earlier machines.

But now the 200MHz StrongARM will be with us by the end of the year, and it promises to speed up the very fastest current Risc PC 700 by up to 500%! Speeding up a computer by a factor of five is no mean feat, and is worth putting into even sharper perspective. On paper, the ARM chips look comparatively slow: a 30MHz chip will be sneered at by PC or Mac owners with Pentium or PowerPC chips of 100MHz or more. There's more to life than just numbers, though, and it's not comparing like with like. In real terms, a 30MHz Risc PC feels just as fast as, say, a 75MHz PowerMac. Consider multiplying that RISC OS slickness by a factor of at least five; the result looks certain to be an awfully nice machine!

There are flies in the ointment, of course. The most significant one is that the performance of the chip will, sadly, be compromised by the RiscPC's architecture with regard to RAM access and bus limitations. Fine machine though the Risc PC is, it was never designed to go that fast, and a new architecture is necessary to make best use of the chip. Also, there will be no floating point co-processor built into the first StrongARMs. Given that the chip works at 200MHz, this isn't actually terribly important; certainly much less so than for current ARM chips. However, it will bother some people. Thankfully, Acorn has been making noises recently about working on high-performance floating point capabilities for Risc PCs, so something is clearly on the cards. Another, smaller, matter of concern is that the press release about StrongARM makes it clear that it is intended for the embedded market; no mention is made of desktop computers at all. However, it can be said with virtual certainty that there will be StrongARM upgrade cards for current RiscPCs by the end of the year; whether the chip makes it into other computers in the future is a moot point. We shall see.

Whatever happens, the StrongARM processor is almost too good to be true: being an ARM, it's just about the nicest chip around from a programmer's point of view; it's cheap (in relative terms); and it leaves the overheated and blustering Pentium standing whilst using nothing more than a couple of AA batteries!

Richard Hallas

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NEWS

ARM programmers consortium launched

Demand for experienced ARM programmers is on the increase, and the arrival of the StrongARM chip will fuel this demand to a great extent. However, because the 32-bit Acorn market has never belonged to the computing mainstream, many of the most experienced ARM coders are not easily visible or accessible by potential clients, who are therefore forced to recruit programmers with no previous ARM experience.

Therefore, a consortium of capable ARM programmers is being put together by WonderWorks, with the aim of promoting the skills of the programmers to appropriate clients. The man in charge goes by the astonishingly apt name of Andy Armstrong! For details, he may be contacted by email on arm@wndrwrks.demon.co.uk, by phone or fax on 01665 602868, or by mobile phone on 0860 922719.

STOP PRESS! Acorn and Apple Join Forces

Date: 13th February. Today, Acorn Computer Group and Apple Computer UK announced a new joint venture company aimed at developing IT solutions for the UK education market. The name and structure of the company will be announced shortly before it starts operating in early April. This venture is part of a broader plan to provide comprehensive IT solutions for the current and future requirements of the European education system.

The new company, based at The Quorum, Cambridge, will be headed by the current Managing Director of Apple Computer, Ireland, Brendan O'Sullivan, with Acorn's David Lee as Chairman of the board, and will be owned jointly by Acorn and Apple UK. There will be four internal departments: Sales, Marketing and Solutions, Finance and Support, and Services and Support. For the time being at least, the company will focus only on the UK educational market, but may set its sights on Europe in the longer term. Non-educational markets will not be addressed at all by the new company; these will be left for the non-allied branches of Acorn and Apple to cater for as before.

The company has committed itself to the PowerPC platform and to RISC OS products, but notably not to RISC OS itself. Acorn developers will be encouraged to convert their RISC OS software to run on Mac OS to provide a wide cross-platform software base and thus gain access to Apple's dominant position in education in the USA and in the rest of the world. Olivetti, the parent company of Acorn, has licensed the Mac OS technology from Apple, and the companies expect to adopt Mac OS as the underlying system for the next-generation PowerPC machines. However, a stated priority of the new venture is to introduce products which will increase the interoperability of RISC OS and the Apple technology.

For the time being, though, current Acorn and Apple machines will be available from the new joint company. Acorn and Apple customers will be able to purchase educational solutions through their normal channels until the new company is operational. At that time, the new company will supply directly to schools, and Acorn Education's existing agencies, together with Apple UK's resellers, will be invited to apply to become agencies for the new company.

For further details, speculation and comments, turn to our special feature on page 34.

Power to Acorn's Elbow

On 5th February, Digital Equipment Corporation (DEC) announced the launch of the first StrongARM processor, the SA-110. The StrongARM family is targeted primarily at mass-market embedded consumer electronics products such as palm-top computers, electronic organisers, set-top boxes and video games. Such is the appeal of the design that industry analysts predict a potential volume in excess of 29 *billion* units in the target markets by 1999.

Robin Saxby, President and CEO of ARM, is quoted as saying that StrongARM will provide "supercomputer-class performance on AA batteries". One industry analyst has described the processor as a "technical tour de force" which "offers a nearly unbeatable combination of performance, price and power consumption". The SA-110 is available in 100MHz, 160MHz and 200MHz internal clock speeds. The 160MHz device is claimed to be the most power-efficient processor available today, whilst the 200MHz device, at a price of under $50, produces the best performance/price ratio at nearly 5 MIPS per dollar. Samples are available now, with full production scheduled to start in the Spring.

Acorn is known to be working on StrongARM processor upgrades for the Risc PC, based on the 200MHz part, and it is likely that these will appear in the third or fourth quarter of the year. Peter Bondar, head of Applied Risc Technologies, has already canvassed for opinions on the Internet about what sort of StrongARM upgrade users would like to see.

The StrongARM announcement, however, is notable because of its failure to mention the use of StrongARM processors in desktop computers. Undoubtedly they will become available in Acorn computers, but in the world at large, a great deal of interest is being expressed by other markets. The following are given particular attention:

Internet terminals: Oracle has already expressed great interest in the StrongARM.

Set-top boxes: Malcolm Bird, CEO of Online Media Ltd, is quoted as saying that interactive set-top boxes require "twice the performance of a desktop PC at one third the cost", and that the StrongARM technology "will help make interactive TV a reality".

Personal digital assistants and electronic organisers: Apple's Newton developers have been working with the StrongARM design team over the last eighteen months, and companies involved with handwriting- and speech-recognition systems are already working on their technologies for use with StrongARM.

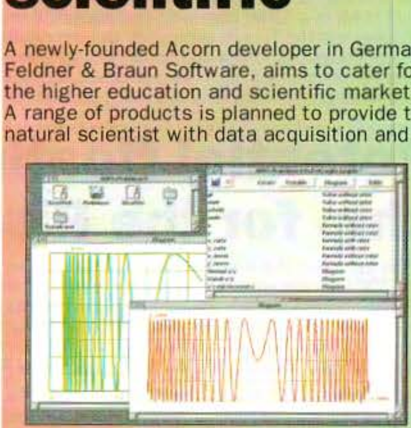
Soft knobs from SEMERC

SEMERC has produced a Soft-Knob Roller Joystick for Acorn, Mac and PC computers. Designed for special needs or young users who prefer a joystick to a trackerball, the Roller Joystick features an optional squeezable ball which is easy for users with muscular difficulties to grasp. The joystick costs £199 ex. VAT, whilst knobs cost £15 ex. VAT. For details contact Trish Hornsey, SEMERC, 1 Broadbent Road, Watersheddings, Oldham OL1 4LB, tel. 0161 627 4469, fax 0161 627 2381.

The Soft-Knob Roller Joystick from SEMERC

Acorns get scientific

A newly-founded Acorn developer in Germany, Feldner & Braun Software, aims to cater for the higher education and scientific markets. A range of products is planned to provide the natural scientist with data acquisition and processing software which are easy to use but sufficiently powerful to meet professional demands. The company's first product, *Praktikum*, is a formula-based program for processing numerical series. Data is stored within named variables rather than in a spreadsheet-like grid, and can be presented in tables and graphs. For further information contact Feldner & Braun GdbR, Kreuz 47, 95445 Bayreuth, Germany, email Andreas.Feldner@uni-bayreuth.de



A couple of sample graphs in Praktikum

Star of the silver manuscript

Sibelius 7 has been used to orchestrate and print the entire score and instrumental parts for the new film, *Loch Ness*, starring Ted Danson. The film score's composer, Trevor Jones, was shown Sibelius version 3's new MIDI and flexi-time features and described it as "the most convincing demonstration of any product I have ever seen". Jonathan Finn, the main programmer of Sibelius, has been working with Trevor Jones' team over the last few months to add features specific to film music, and Sibelius 7 has also been used in production of the film, *Richard III*, which is currently showing in the US and scheduled to appear in Britain later this year.

Sibelius 7 has also recently been featured in *The Times*, both in the world-famous leader column and in an extremely flattering full review. One of the prime attractions of Sibelius is its ease of use: the time required for a computer-illiterate musician to become reasonably proficient at using the Acorn computer and Sibelius, after receiving a complete system as new, is typically around 20 hours. On the other hand, with Finale and Score (the rival packages on the Mac and PC) the corresponding times are respectively around 8 months and 18 months.

Thumbs up for ARM-based products

Yet another company is producing an ARM-based Internet appliance. *Easy Rider*, from Teknema Inc in the USA, is an ARM7500-based network computer running Teknema's own web browser which also effectively doubles as the operating system. The most basic system features a 4Mb processing unit with modem, VGA display, keyboard and mouse, and has an estimated cost of under $500. Units are expected to ship from the second quarter of the year. For further details, contact Teknema Inc, 535 Middlefield Road, Suite 220, Menlo Park, CA 94025-1854, web page http://www.teknema.com, tel. (415) 833-7910, fax (415) 833-7919.

ARM has also licensed its ARM7TDMI processor core to Oki. The ARM7TDMI is a 32-bit core with EmbeddedICE debug, DSP optimised multiplier and the Thumb extension. Oki will create and sell custom application-specific chips and controllers for use in car electronics systems, computer peripherals (such as disc drives, CD-ROM drives and printers) and multimedia communications systems (such as mobile phones and PDAs).

Potential floating point chip for the Risc PC

At the launch of the Risc PC, Acorn promised that there would be an ARM700 upgrade with FPA, but there were problems with modifying the ARM700 design to take advantage of the second-generation floating point accelerator, and after a year of unsuccessful efforts, the product was abandoned. However, Acorn has stated that it is now accepting orders for a Risc PC ARM700 processor card with additional floating point accelerator.

It is actually quite unlikely that the ARM700/FPA will become available because the current level of demand does not justify the costs involved in setting up a production line. Nevertheless, if there turns out to be sufficient demand for the product (code ACA51), Acorn is willing to initiate a one-off production run. For this to take place, Acorn needs to receive 1000 firm, non-cancellable orders for the card, at a price of £299 ex. VAT. The proposed short-run card, which would in effect be produced as a concession to those few users who really need floating point capability, would return to the original design and, at 30MHz, would offer an FP performance similar to the A5000 with FPA.

Acorn has also stated that it is investigating alternative ways of providing high-performance floating point capability in the longer term, for use with existing and future models of the Risc PC.

NEWS IN BRIEF

The BBC has announced that a Risc PC600, fitted with a Millipede Alphalock card and running ANT's Fresco web browser, will be used to display web pages in a regular feature on the Saturday morning TV programme, *Live and Kicking*. This combination of hardware was found to give better on-screen results than a conventional VGA display and a computer-to-PAL converter.

Following from ViVID20 and ViVID CGA, iSV Products has released ViVID 5000, which is specially designed to run on the A5000 with a 14" or 15" monitor. Like the earlier versions, ViVID 5000 allows computers to display much increased desktop work areas; in this case up to 2240 by 2016 in size. In addition to nearly 100 screen modes, ViVID 5000 offers colour and contrast controls. The price is £16.50 all inclusive, and upgrades from ViVID20 are available for £5. Contact iSV Products at 86 Turnberry, Home Farm, Bracknell, Berks RG12 8ZH, tel. 01344 55769.

XOB has launched a new version of the software for its Risc PC *Tele-Card* teletext podule. The new software can show how teletext is received in real time, and can strip out programme subtitles as they appear, saving them into a text file. The price of the Tele-Card and software is £152.00 ex. VAT for a single-user system, or £342.00 ex. VAT for the network version. For further details, contact XOB, Balkeerie, Eassie, Angus DD8 1SR, email TeleCard@xobs.demon.co.uk tel. 01 307 840 364.

A new fact-file web page has been added to the Acorn Cybervillage which details over 400 Acorn-related companies. Check out http://www.cybervillage.co.uk/acorn/fact.htm

ARMature Online has become the first Acorn bulletin board to offer off-site access through the Internet. Based in Australia, ARMature Online offers normal dial-up or Internet access to its file ares, user-supported areas, mailing lists, free web pages and so on. The BBS can be reached via its web front-end on http://www.armature.net.au, or on tel. +61-2-580-9938 24 hours a day.

An Acorn dealer in the far north east of Scotland is offering cheap Internet access. Tower Electronics Ltd is based in Fyvie, near Aberdeen, and offers high-speed local call-rate connections and personal web pages for just £8 ex. VAT per month. Telephone support is available if required. For more details, email tower@enterprise.net or visit the Tower web site: http://www.enterprise.net/tower-risc

What's Cooking at ARM?

Alan Bonsor looks at the most internationally successful company ever to emerge from the Acorn fold

PRESS RELEASE....... PRESS RELEASE....... PRESS RELEASE....... PRESS RELEASE....... PRESS RELEASE....... PRESS RELEASE.......

MAYNARD, Mass, February 5, 1996: Digital Equipment Corporation (DEC) today introduced the much-anticipated SA-110 StrongARM microprocessor, the first processor to combine the performance of a supercomputer with power dissipation low enough to run on AA batteries, and pricing which is geared toward mass-market, consumer electronics products. "The StrongARM microprocessor family is one of the cornerstones of our merchant vendor strategy," said Ed Caldwell, vice president of Digital Semiconductor. "We see tremendous opportunity to deploy this technology across many mass-market application areas." According to industry analysts, the potential microprocessor volume for the StrongARM target markets - personal digital assistants (PDAs), electronic organisers, set-top boxes and video games - will exceed 29 billion units by 1999.

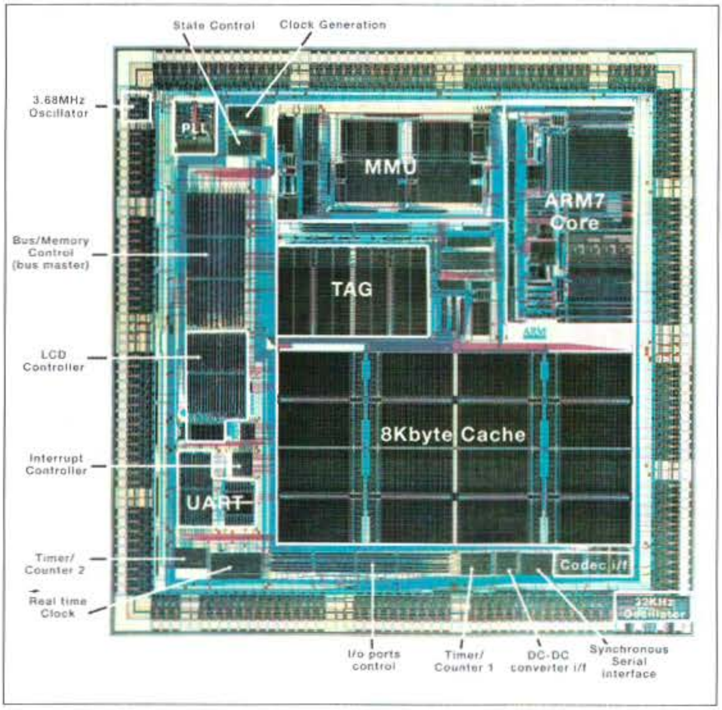
The SA-110 microprocessor is the first member of the StrongARM family resulting from the architecture license agreement between Digital and Advanced RISC Machines Ltd. (ARM), developer of the ARM 32-bit RISC architecture. "Combining ARM's low-power architecture with Digital's high-performance processor design expertise and CMOS process leadership has created a new paradigm for embedded consumer electronics products - supercomputer class performance on AA batteries," said Robin Saxby, president and CEO, ARM Ltd.

Industry watchers see a bright future for the StrongARM technology. According to Jim Turley, senior analyst, Microprocessor Report, "The SA-110 StrongARM processor is a technical tour de force and a milestone for both Digital Semiconductor and the ARM architecture. It offers a nearly unbeatable combination of performance, price and power consumption." Tim Bajarin, president, Creative Strategies International, commented, "The design of the SA-110 has clearly involved PDA developers, smart phone manufacturers, set-top box suppliers, and even companies exploring the internet computer. This type of foresight heralds a new wave of mobile products which meet consumers' real needs.

The StrongARM SA-110 processor is the latest in a long line of revolutionary designs which have appeared over the last eight years and which have guaranteed both Acorn and ARM an important position in the annals of computing in the late 20th Century. Announcements such as the one above illustrate the success of a business strategy which, over the past five years, has turned ARM Ltd into one of the most successful and respected processor designers in the world.

A brief history of ARM

In 1987 Acorn launched the world's very first RISC-based microcomputer. The Archimedes A300 series was based around a processor called the Acorn RISC Machine 2 (ARM2) which had been developed in-house over the previous few years by Acorn's advanced research department. At a time when 16-bit technology was all the rage, Acorn had taken the brave and radical decision to get ahead of the industry and develop a 32-bit RISC-based personal computer. The resulting 8MHz ARM2 processor, which performed at approximately 4.76MIPs, was unique in that it offered high performance at a very low cost and was exceptionally power efficient. The ARM3 processor following shortly afterwards, more than tripling both the clock speed and the number of MIPs. Acorn recognised that they had something special on their hands, and in November 1990 joined forces with Apple Computer and VLSI Technology to create a new research and development company which could exploit and market the potential of ARM technology. And so Advanced RISC Machines Ltd (ARM for short) was born. Robin Saxby, previously at ES2, now one of ARM's partners, and Motorola, became CEO and Managing Director soon after ARM's formation, and in April 1993, Nippon Investment and Finance (NIF) became ARM's fourth investor.



The ARM 7100 computer-on-a-chip with ARM7 core

The company's growth over the past five years has been phenomenal. Its revenues have grown at a compound annual growth rate of 78%, and from an initial staff of just 12, there are now over 1,000 people working full time on ARM development around the world, including ARM's partners.

What does ARM actually do?

ARM doesn't actually manufacture anything at all. It designs processors which all share the same innovative features which first appeared in the original ARM2 processor: high performance processors which cost very little and are very power efficient. ARM processors feature the best performance/cost and performance/power consumption ratios in the industry, so good in fact that they are enabling whole new classes of portable and consumer computing devices to be developed, as DEC's StrongARM demonstrates (see below).

ARM then markets and licenses these designs to semiconductor manufacturers such as DEC, who become partners with ARM and who focus on manufacturing both the processor itself and processors based around the ARM core, as well as marketing and creating applications for the technology. ARM forms partnerships with firms that will expand the total ARM market by integrating their own intellectual property around ARM processor cores. The unparalleled breadth of expertise in the partnership ensures ARM-based solutions meet almost every customer's processor needs. ARM's semiconductor partners are:

Asahi Kasei Microsystems
Cirrus Logic
Digital Semiconductor
ES2
GEC Plessey Semiconductor
LG Electronics
NEC
OKI
Samsung Corporation
Sharp Corporation
Symbios Logic
Texas Instruments
VLSI Technology

This business model, called the *Compelling Partner Business Model*, has enabled the ARM architecture to be adopted globally far faster than possible for a traditional semiconductor company.

Because ARM processor cores are very small, with as few as 35 thousand transistors for a basic ARM7 core, compared with 4 million and higher for other manufacturers' RISC processors, they are ideal for integration into larger application-specific custom chips. Recent examples of high-integration ARM-based solutions include:

VLSI: ARM7500 net-surfer on a chip
Apollo SSA
Gatekeeper
AT&T IVES chip
Firefly Fibre-channel control
Ruby II comms controller
VIP ISDN controller
GSM, DES and DECT chips
GEC Plessey Semiconductor:
Spider, Mantis and Butterfly communication controllers and Global Positioning solutions
Sharp: LH77790 integrated LCD organizer CPU
Texas Instruments:
TMS470 'Thumb' microcontrollers
Cirrus Logic:
ARM7100 PDA system-on-a-chip
Digital: StrongARM SA-110

All about StrongARM

The StrongARM SA-110 processor is being promoted as the processor which will make real-time handwriting and speech recognition an affordable reality, as well as making low-cost Internet Terminals, voice-controlled personal digital assistants, set-top boxes and second generation video games possible. There is a handful of other RISC processors from other manufacturers which offer the necessary power; however, they are too expensive to include in consumer products, costing at least ten times more than the SA-110, and they are too power-hungry to be included in portable devices.

The StrongARM SA-110 can be powered by two penlight batteries

The SA-110 is available with three different clock speeds: 100MHz, 160MHz and 200MHz. These three processors deliver 115, 185 and 230 MIPs respectively, making the 200MHz version the fastest microprocessor in the world. While these figures are very impressive, it is the power requirements and costs which count even more. The 100Mhz SA-110 dissipates less than 300mW and costs less than $29 when purchased in 10,000 unit quantities. A comparable PowerPC processor gives only 60 MIPS, dissipates 1.2W, and costs five times more. The 200MHz SA-110 dissipates under 900mW and costs less than $50. The only processor comparable to the 200MHz SA-110 is the SH4 from Hitachi which is planned to deliver 200 MIPs at 1.4W. However, it doesn't exist yet.

Where do ARM processors go?

Given their strengths, ARM processors have big advantages for portable, consumer and embedded control applications. The number and breadth of systems into which ARM CPUs and cores have been designed, demonstrates their versatility and benefit. Below are a few of the ARM Powered applications available now. ARM has many more design wins in these and similar markets to be announced in 1996 and 1997.

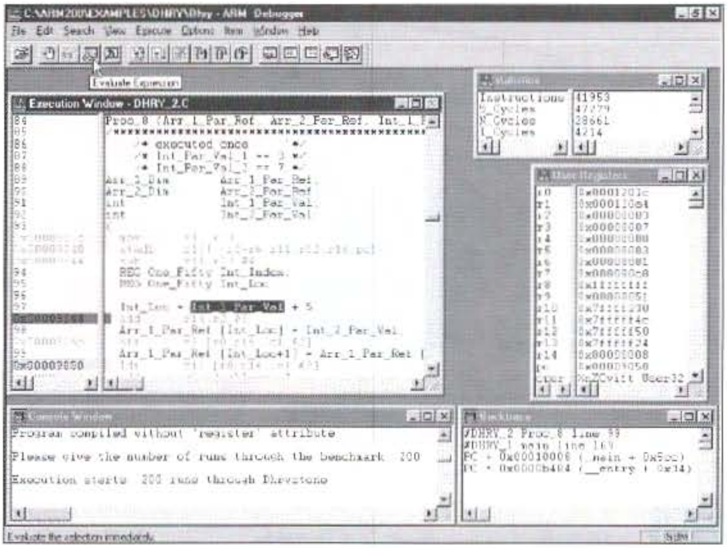
Portable:
- **Apple Newton PDA**
- **Communicate fax modem**
- **Geode cell-phone modem**
- **PCSI GSM, PCS & DAMPS phone designs**
- **SPYRUS LYNKS security card**
- **plus upcoming mobile phones, PDAs, GPS**

Consumer:
- **3DO and M2 video games**
- **Acorn multimedia computers**
- **Canadian Marconi GPS engine**
- **Gemplus Advanced smart-cards**
- **Rediffusion arcade game**
- **Online Media, Viewcall netsurfers, STBs**

Embedded:
- **ATM Ltd switches & servers**
- **AT&T IVES encryption system Control**
- **Eidos video editing system**
- **Emulex Firefly Fibre-Channel**
- **Hagenuk ISDN, DECT phones**
- **IBM Serial Storage Architecture**
- **Mykotronx encryption engine**
- **Schlumberger Scorpion data logger**

The future

According to Trent Poltronetti, ARM's Marketing Communications Manager, all the hype is always about who has the fastest processor chip for desktop computers. Yet even if you include the relatively slow Pentium in the equation, only


ARM Debugger
File Edit Search View Execute Options Item Window Help
Evaluate Expression
Execution Window - DHRY_2.C
Console Window
Evaluate the selection immediately

```
Program compiled without 'register' attribute
Please give the number of runs through the benchmark: 200
Execution starts, 200 runs through Dhrystone
```

```
#DHRY_2 Proc_8 line 99
#DHRY_1 main line 169
PC = 0x00010006 (_main + 0x5cc)
PC = 0x0000b4R4 (__entry + 0x14)
```

ARM's development toolkit for Windows 95

100 million or so of these processors are required by this market every year. This is a tenth of the volume of the current 'embedded control' markets (computers hidden away in things that are not computers to make them run better, like cars, printers, mobile phones, TVs, etc.). This market is expected to expand at a massive rate: DEC predict 29 billion units by the end of the century.

Trent emphasizes that, "having a technically better chip is not enough to make it sell in these markets. You also have to have development software, development hardware, operating systems and application software. Initially, ARM sold on the technical lead of its processors, to some success. Competitors have now recognized the value of the price/performance space we are in, and are working hard to catch up. We are working hard to stay ahead, but to be a real success, ARM has to offer the complete systems development solution in combination with the strength and expertise of all its partners."

ARM has already garnered significant third party support to complement its own development tools, including:

Accelerated Technology's Nucleus RTOS
Acorn's RISC OS
Acorn's RISC iX Unix OS
ARMTools 2.0 Integrated Development System
Cogent's Universal Development System
Eonic Systems's Virtuoso RTOS
Etnoteam's EOS RTOS
Hewlett-Packard's Logic Analyzers
IBM's Microkernel Workplace OS
Integrated Systems Inc's pSOSystem
Lauterbach's Trace32 In-Circuit Emulator (ICE)
Perihelion's Helios RTOS
Tao Systems' Taos Operating System
Universal ICE
VLSI's Jumpstart GUI
Yokogawa/Orion's 'advice' ICE

What is an RTOS?

A Real-Time Operating System differs from operating systems such as RISC OS in that it is designed to control devices in which timing is critical: everything from TVs, washing machines and mobile phones to car airbag systems, avionics and aerospace technology, hospital equipment, etc. One of the best examples is that of the system which controls the launching of the airbag in a car: if you're in an accident, you don't want the subroutine which controls the split-second firing of the airbag to be hanging around in a slow area of memory. It has to be as close to the processor as possible, so that when it's called it can execute within the same 100th or 1000th of a second as it's called in.

ARM's newest partner, announced on the 12th February, is Integrated Systems Inc. (ISI) who develops the pSOSystem, the world's most widely-adopted real-time operating software (RTOS) for embedded microprocessors. The joint development is designed to dramatically shorten the design cycle time required for systems designers to migrate to ARM-based embedded solutions. "The fusion of ARM and pSOS represents dramatic value for the embedded systems developers," said David St Charles, Integrated Systems' president and CEO. "The combination promotes rapid and cost-effective development of highly sophisticated products for multimedia, entertainment, consumer electronics, and low-power hand-held devices."

Other partnerships

ARM maintains its competitive advantages through heavy research and development and partnerships with research organizations like the Universities of Manchester and Cambridge. For example Steve Furber's group at Manchester recently made the world's first fully asynchronous implementation of a commercial processor, an ARM60. ARM retains rights to this partner research, enhancing its rich patent portfolio. ARM is also active in the Open Microprocessor systems Initiative (OMI), part of the European Union's ESPRIT research development program. Results from OMI supporting ARM research have been commercialized in ARM products like Thumb and EmbeddedICE debug.

For further information...

To learn more about Advanced RISC Machines and its partners, visit the ARM world wide web site at: `http://www.arm.com`

Photodesk Pro Unveiled

Lee Calcraft test drives a pre-production copy of Spacetech's latest masterpiece

We all knew it would be released one day, and Photodesk Pro's day is almost here. In fact by the time you read this, it should be available. Without a shadow of a doubt it was worth the wait, and even from a cursory look at the package I can see why the upgrade was not a trivial task for the project team.

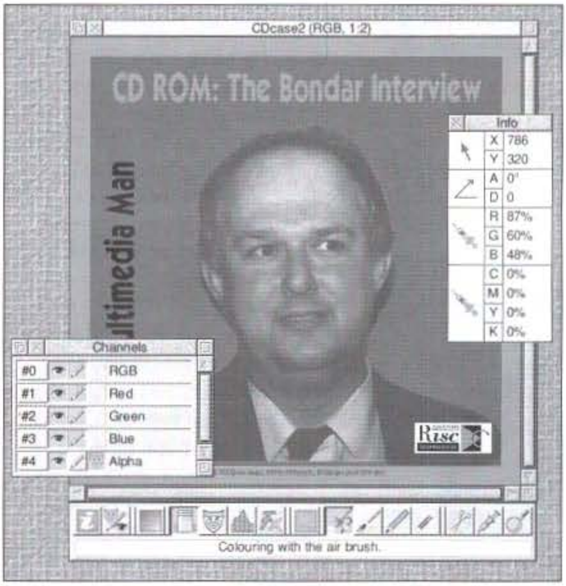


Figure 1. Peter Bondar experiences the two new dialogue boxes.

In fact, when you install Photodesk Pro and load up your first image you could be forgiven for thinking that not very much had changed. Even the tool icons look very, very similar. There are in fact just two new icons on the main tool bar; and to make room for them the three paint pots have been squeezed into one. The two new additions are a simple information window giving a readout of pointer and colour information, and a vitally important dialogue box which controls the new masking and channel features of the package - of which, more later.

Just to give an idea of how much has in fact changed, the booklet covering the new features of Photodesk Pro takes some 46 pages, and covers features as diverse as pressure sensitivity and the new RGB and CMYK conversion tables. But before existing users begin to panic, it should be said that, as suggested by the minimal changes to the tool bar, the new features have been incorporated seamlessly into the existing package, and for the most part take the form of extensions and improvements to existing features rather than a revamp of the whole package.

For example, Photodesk's excellent airbrush now has an option to make the effect of the brush even smoother. This employs a buffer, so that if you do fast strokes the airbrush will finish the job after the pointer has moved on - a little disconcerting at first. A second new option, *Stream*, allows the airbrush to continue to add colour even when stationary, so making it behave more like a real airbrush. As for the paintbrush, users will be pleased to hear that this is now fully anti-aliased, and that the degree of anti-aliasing is user-selectable.

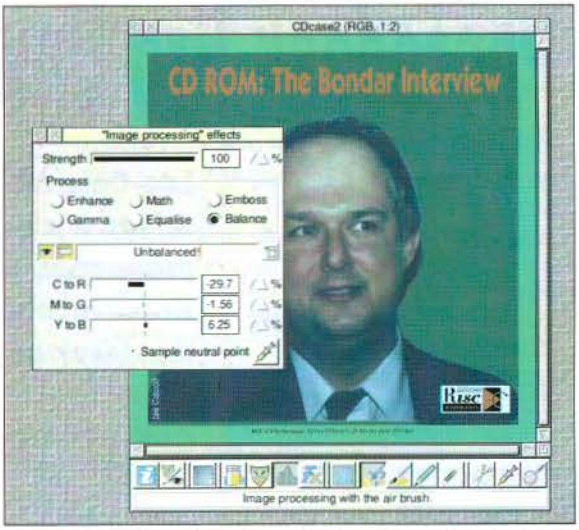
Colour balance

As you wander through the package, you will see that many of the familiar dialogue boxes now have subtle extensions. For example the *Image processing* dialogue now boasts a sixth button: *Balance (see figure 2)*. This allows you to alter the colour balance (or colour temperature) of an image. It works in the same kind of way as the White Balance button on a video camera in that it establishes the exact balance of colours (the colour temperature) that will be represented as white. Some scanned images, for example, may have a slight blue or magenta bias. The Balance option will fix them in an instant. You can even sample the colour from any part of an image and use it as the white-balance point.

What makes the use of this even easier is the extension of Photodesk's *Preview* options. It is now possible to preview very many of its filters and effects, either in a special preview window, or on the main view. And because of the speed of the ARM processor and of Photodesk's ARM code, most of the previews are virtually instantaneous.

Copy rework

One area in which previews are particularly welcome is in the *Copy* facilities. I had always felt that


CDcase2 (RGB, 1:2)
CD ROM: The Bondar Interview
"Image processing" effects
Process
Enhance
Math
Emboss
Gamma
Equalise
Balance
Sample neutral point
Image processing with the air brush.

Strength 100 %

● Balance

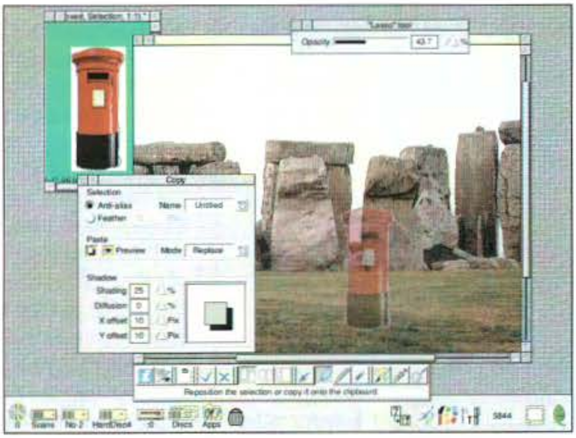
Unbalanced!

C to R -29.7 %

M to G -1.56 %

Y to B 6.25 %

Figure 2. Caught off balance with the new image processing tool.



Opacity 43.7 %

● Anti-alias

Name Untitled

Mode Replace

Shading 25 %

Diffusion 0 %

X offset 10 Pix

Y offset 10 Pix

Figure 3. Pillar box virtual pasting with low opacity so as not to spoil the view too much.

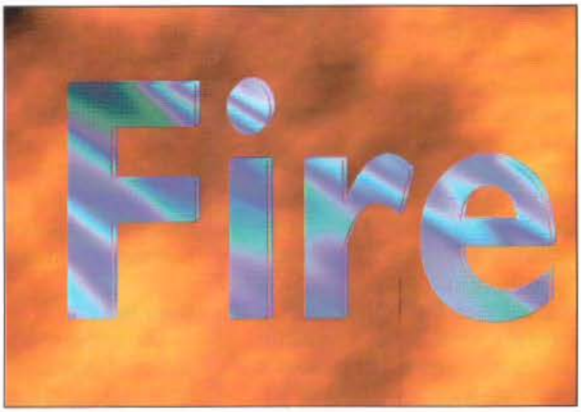


Figure 4. Using the displacement filter to create a 3D effect on the text. The textures are both from the *Texture explorer*.

Photodesk's copying features were less easy to use than they might have been, and I must say that I am bowled over by the new implementation. Once you have marked out an area to copy from, using the lasso or the rectangle marker (the pointer icon), you can simply push around an outline of the shape, and whenever you release the mouse button the image will be pasted. But in preview mode this is not a real paste but a virtual one, and you can reposition the pasting point as many times as you like before clicking on the tick icon to make it happen for real.

Because of the new preview mode the pointer and lasso *Opacity adjuster* window really comes into its own (see figure 3). As soon as you release the mouse button on the opacity slider the pasted image is redrawn at the new opacity. With small areas this responds at lightening speed, and the whole process becomes very interactive, allowing you to get just the effect that you are after. And wonder of wonders, the original marking does not disappear as it does in the previous version, so you can at last perform multiple copies.

All this, and I still haven't mentioned the new extra window associated with the *Copy* tools. This introduces a whole series of other features including the use of anti-aliasing or feathering, the use of automatic drop shadows and even the way in which the two images will be combined. Spacetech have even built intelligence into the lasso tool. If you are using it to move a cut object to the area where it is to be pasted, any time that you click with the tool outside this immediate area it assumes that you want to make a new cut, so you do not need to touch a single button to perform large numbers of cuts and pastes. The only thing that you cannot do is to paint with a small portion of cut image.

FX aplenty

Special effects is another area that has been seriously reworked, and the FX menu contains one or two important extras. There is now a Displacement filter and a Textures explorer - both little items that Photoshop users with KAI's plug-in tools will be familiar with. And perhaps as a further piece of inspiration from that venerable Mac-friendly package, Photodesk's filters are now themselves plug-ins. This means that third parties should be able to write plug-in filter modules which extend Photodesk's functionality - providing we can get the interface details, that is.

The displacement filter is a rather clever idea. It provides an entirely different way of altering one image on the basis of another. Normally when two images are combined, the colour of the pixels in the final image reflects the result of a mathematical combination of the pixels in the two original images. For example, the two might be added in a certain proportion. With a displacement filter, by contrast, pixels in the original image are *moved* or displaced by an amount depending on the brightness or otherwise of the controlling image (usually held in a mask or alpha channel).

The displacement filter has a number of applications. By using a driving mask consisting of a number of small dark dots it can be used to recreate the effect of looking though frosted glass. It can also play a vital role in creating 3D effects. When creating 3D lettering it can be used to move the face of a piece of text in a way which appears to bring it forward to create a 3D effect (see figure 4).

Fractal textures

The Texture explorer is something completely different. This is essentially a fractal texture generator. It uses fractal mathematics to create an infinite set of textures, which can either be

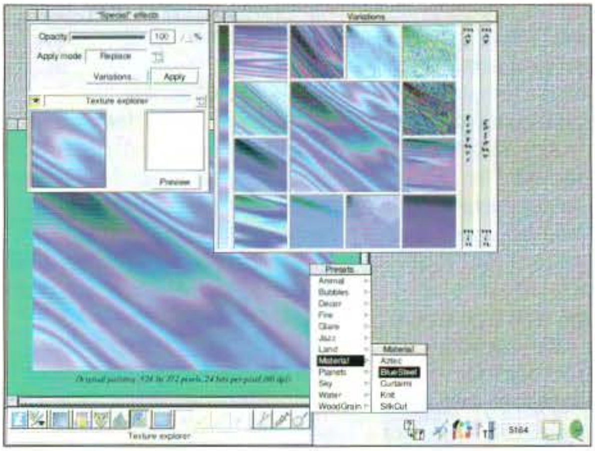


Figure 5. Some of the infinite variations on *Blue steel* in the *Texture explorer*

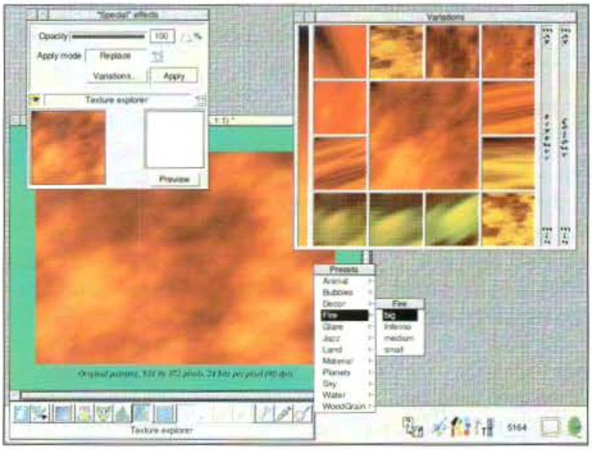
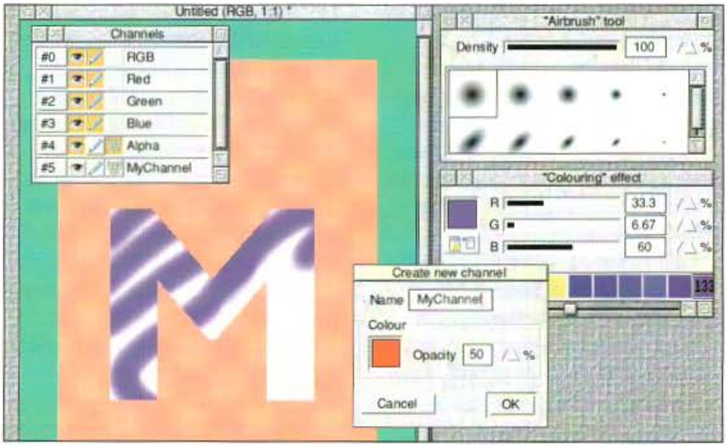


Figure 6. Texture explorer variations on Big fire



Density 100 %

R 33.3 %
G 6.67 %
B 60 %

Name MyChannel
Opacity 50 %

Figure 7. Channel play - airbrushing with an inverted mask, and creating more mask channels

applied to any canvas, or passed through Photodesk's other texture generator to create a seamless 128 x 128 pixel greyscale texture. Of course, once you have copied the fractal texture to a canvas you can then pick it up and use it for any other purpose, but the fractal generator does not allow you to apply a fractal texture directly with tools like the airbrush or the pencil. You can, though, apply it through a mask, which makes it easy to generate beautifully textured captions.

Photodesk Pro

Supplier	Spacetech 21 West Wools Portland Dorset DT5 2EA Tel. 01305 822 753 Fax 01305 860 483
Price	£229.36 ex. VAT Upgrades £59.42 ex.VAT

Even though there is an infinite variety of effects, the user interface provides excellent control. As you can see from figures 5 and 6, there is a central display which gives the current texture. This is surrounded by a set of 12 variants, just as on KAI's plug-in Texture Explorer on Photoshop. Clicking on any of these makes it the selected display. But there are two other controls. Along the right-hand side you can click on the *Texture* or *Colour adjuster* to randomly alter either of these factors to create 12 new textures from the currently selected one. Clicking at the top of the column gives maximum change, while lower down changes are smaller. With these controls you can very quickly generate a massive range of possible texture effects in as many colours.

But to get you going in the right direction there is a menu of forty or so presets. To create the effect in figure 6 I selected *Fire* and *big*, and then varied the texture slightly. From the *Blue sky* option I was able to generate a very nice hazy blue sky ideal for a title screen background, and the *Blue steel* was also very impressive - perfect for using as a texture for some bold 3D wording.

Masks and Channels

And finally the bit that I left until the end. Not because it is of little importance, but rather the reverse. In the original Photodesk each canvas could make use of an optional masking channel. You could draw directly into a mask, and could create a mask from your last drawing action. The mask could then be used during further tooling if desired. For example you could write some text into a mask, invert it and then if you airbrushed all over the canvas, the ink would only hit the canvas in the unmasked areas, so the text acted like a kind of stencil (see figure 7).

This whole area has been considerably developed to make it more like industry standard packages such as Photoshop, though Photoshop's very useful Layering techniques have not yet been cloned. Each canvas now has a number of channels, and these can all be controlled individually. One channel is allocated to the mask, one to each of the red green and blue components of an image, and one to the whole image (red, green and blue combined). As you can see from figure 7, you can control which of these channels you will see on a canvas (using the eye icon), which you will write to (the pencil icon) and whether any is specified as a mask (yes, the mask icon). You can also add any number of extra channels to a particular canvas so that you could have, say, six mask channels, which could be used separately or in combination.

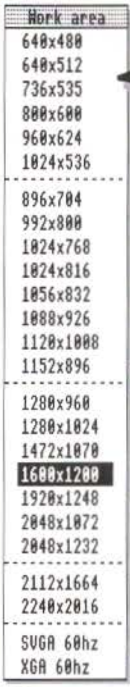
As you might imagine, this gives the user massive flexibility, and enables him to perform tasks which were quite awkward with the original version. The new system is inevitably a bit harder to get to grips with from the user's point of view. As the manual points out, however, for many operations you may not ever need to think about the way in which the channels are organised, and simply use the defaults.

Having said this, I am already beginning to get used to the way it works. To see it in action let's start by doing something simple. Suppose we want to play around with a caption. It is a good move to write the caption into the mask channel, then you can do anything you want with it at any time. So, just ensure that the eye and the pencil are selected for the Alpha channel (so that we can both see it and write to it). But do not select the mask itself, because we don't want the mask to be operational since we are trying to write into it. As to the other channels, we must deselect the pencil icon because we do not want to write anywhere except to the Alpha channel mask.

Now select black as the painting colour (other colours give a fainter mask - a point worth remembering) and drop your text onto the canvas. This will create a mask for the text. Use the menu option to invert this, and we are ready to go. To make the mask effective, click on its icon in the *Channels* dialogue in the Alpha channel. Now select the pencil icon in the RGB channel, and everything you paint on the canvas will go through the mask (as in figure 7). As before, you can reposition the mask by moving the pointer with Shift held down, or can now make the mask ineffective by deselecting the *Mask* icon in the *Channels* dialogue. And if you need a second mask, just create a new Alpha channel from the *Channels* dialogue menu. Brilliant.

As you may have guessed, I am not just impressed by Photodesk Pro, I am really bowled over by it, and cannot wait for the full release version to appear. If it was up to me, Spacetech would get the RISC User gold award for this product.

Fancy a New Image?



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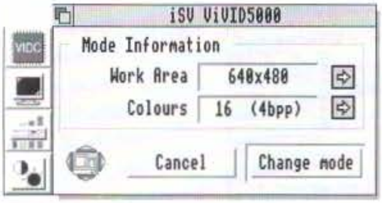
ViVID 5000

The graphics enhancer on a disk

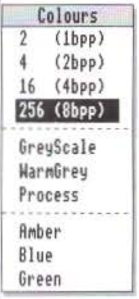


iSV ViVID5000

Mode Information

Work Area 640x480

Colours 16 (4bpp)



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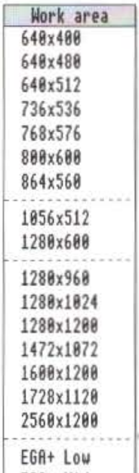

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- **Extended 4 colour greyscale dithering**
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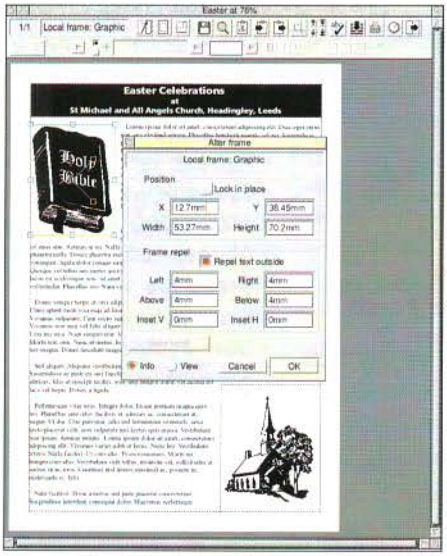
DTP Workshop

Keith Parker revives our popular series on desktop publishing, starting with a roundup of entry-level DTP packages

In this series I hope to show all users of Acorn computers just what a powerful tool they have at their fingertips. These pages are intended to be of interest to everyone, regardless of DTP experience. I will be giving hints, tips and advice as well as finding solutions to software limitations. In short, I intend to look at every aspect of production of a desktop publishing project, whether it is a simple advertising leaflet or a complex magazine! I hope that these pages will help users improve the quality and design of their work. If there is a topic or question (especially of the "How do I do xyz?" type) that you want covering, do please write in and tell me. I would also appreciate users sending me pieces of work for use in practical 'make-over' articles.

Entry-level DTP packages

To kick off the series we begin with a brief overview of the major DTP packages. This month, we consider the entry-level packages, *Impression Style*, *Ovation*, *TextEase 2* and *PenDown DTP*. These are designed to create pages of mixed text and graphics, but they are easy to learn and do not offer the more advanced and complex options required for full colour imagesetting. The requirements of the more advanced or ambitious user will be covered in the next workshop, when we look at Impression Publisher and Publisher Plus, together with a first view of Ovation Pro.



Local frame: Graphic
Position
☐ Lock in place
X 12.7mm
Y 38.45mm
Width 53.27mm
Height 70.2mm
Frame repel
☒ Repel text outside
Left 4mm
Right 4mm
Above 4mm
Below 4mm
Inset V 0mm
Inset H 0mm
● Info ○ View
Cancel OK

Figure 1.
Altering frame attributes in Impression Style.

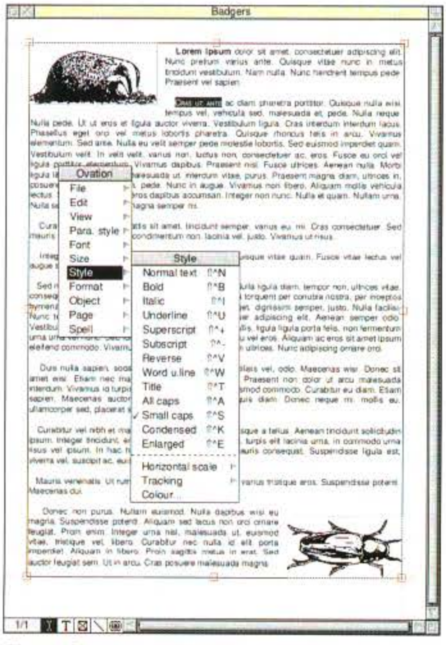


Figure 2.
Assigning text effects in Ovation.

Impression Style

Impression Style was launched to replace Computer Concepts' *Impression Junior*. It is an excellent word processor with adequate graphical support, and comes with *WordWorks*, CC's dictionary and thesaurus program, *Equasor*, an equation editing program, *TableMate*, designed to make table production easier, and a good manual complete with a tutorial.

Style will run from floppy disc but it is recommended that you install it on hard disc. It will run in 2Mb RAM with RISC OS 2, though RISC OS 3.1 or greater is recommended. If you have a hard disc, you will need some 3.6Mb of free space for a full installation. Style is easy to learn to use: whilst some of the more complex features will require consultation with the manual, the configurable button bar makes it easily accessible.

Style has powerful Master Page facilities: these are special pages that are used to set up the overall layout of the document. If you change a master page, all the pages in your document which are based on it change retrospectively. If anything lets

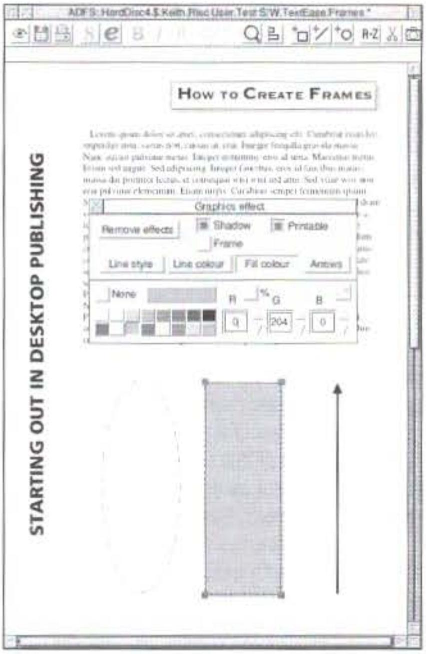


Figure 3.
Editing graphic effects in TextEase.

Style down, it is the awkwardness of creating pages: it is very difficult to join frames visually (for example, to create a flowchart), and it is impossible to perform simple step and repeat functions (creating multiple identical frames) except by copy and paste. Once you have finally set up your page, altering frame borders, text runarounds (see figure 1), background colours and so on is, thankfully, easy!

The text handling facilities in Style are superb. You have a choice of styles or effects: styles are more complex to create initially, but quick to use once set up. Styles can apply from as little as a single letter to the entire document, and if you edit a style, it changes through the entire document. When using styles, you can control all manner of text effects including the font, weight, style, colour, size, underlining, hyphenation, alignment and rules.

Style allows you to simply drop a bitmap (sprite or TIFF) or vector (Draw or ArtWorks) file into any undefined frame. Once done, the frame becomes a graphic frame only, and text cannot be entered afterwards; and the converse applies if you put text in a new frame. Images can also be resized, rotated, made to fit the frame, etc. Style was the first program to offer OLE (Object Linking and Embedding), which allows you to double-click an object in a frame, whereupon it will be loaded into an appropriate editor; and closing the edited version will send it straight back to the frame. OLE can be used with sprites, Draw and ArtWorks files, tables and equations.

The printing dialogue box lets you choose options such as sideways (landscape) printing, scale, pamphlet mode and, for multiple-page and copy creations, collation.

Ovation

Ovation from Beebug arrived at the same time as Impression and has a good following in schools. In many respects it is similar to Impression Style, though it lacks the easy-to-use button bar and the superb text style options, but includes many more tools that make page layout easy. The package includes some fonts, clip-art and a good manual.

Ovation will run from a floppy disc but installation on hard disc is recommended, requiring 1.5Mb of free space. It is happy running in 2Mb of RAM and requires RISC OS 3.1 or greater, although Beebug will supply a version upon request for users of RISC OS 2.

I found Ovation a relatively easy package to get started with, though the addition of a configurable button bar would have made it easier to learn and use. Like Style, there are features in the package that will require users to consult the manual. Where Ovation scores highly is in its page layout tools: it is easy to create text and graphic frames, and if you need to draw links between frames or create tables, Ovation provides a line tool which is user-definable. It also allows you to do step and repeat: if you need ten small frames on a page, you only need to create one; the step and repeat facility lets you define the number and spacing of duplicates.

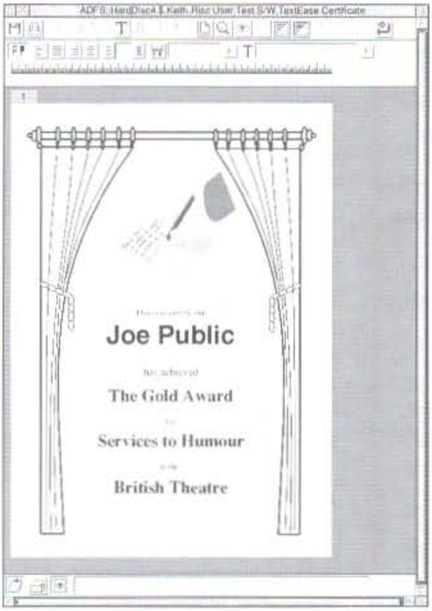
Text handling is good, though not as well implemented or as easy to use as in Impression Style. Text is entered in a preselected style called *BodyText*, and Ovation provides a menu option called Style (see figure 2) which is, confusingly, similar to Impression Style's *Effects* menu. Definable styles are available as Paragraph styles, but these are limited to whole paragraphs (i.e. areas of text separated by carriage returns); single letters or words require you to apply effects individually. This is less powerful and much more time-consuming than Impression Style's implementation.

Like Style, Ovation will not let you have rotated text frames; instead, rotated text must be created in Draw or ArtWorks and then imported as a graphic. The importation of graphic files into Ovation is limited to Draw, ArtWorks and Sprite files, and options are available to manipulate the graphic once inside a frame. There are, however, no OLE facilities. Ovation's printing options are flexible, providing portrait and landscape printing, galley or pamphlet modes, scale, multiple copies, page ranges and collation.

TextEase version 2

Softease's *TextEase* hit the Acorn market in 1994 and developed a considerable following, particularly in schools. TextEase 2 was launched in 1995 together with a talking variant (see last month's review).The package includes fonts, clip-art, configuration options, label templates and tutorials, together with an excellent and easy-to-use manual. TextEase 2 requires 2Mb of RAM and RISC OS 3.1 or greater, and can be run from floppy or hard disc, where the installation requires 2Mb of free space.

If, like me, you have been conditioned to frame-based DTP packages (like *QuarkXPress* on Macs, *PageMaker* on PCs or *Impression* on Acorns), TextEase provides a major culture-shock and is not like any other DTP package I've ever used. The nearest analogy I can use to describe how you work is to think of a blank piece of paper and a pen: you decide where you want to start, and go for it! Initially I kept getting it wrong because I was thinking of frames; once I forgot frames, I created the page shown in figure 3 in ten minutes. I use Impression Publisher every day, and it took me half an hour to create the same page using Publisher and ArtWorks! Just below the configurable button bar is a status bar which tells you what each button does, how to resize frames, etc as well as the exact location of the cursor. If you have never used a DTP package before and start with an open mind you will find it has a very short learning curve indeed!


ADFS::HardDisc4.$.Keith.Risc User.Test S/W.TextEase Certificate

Joe Public

has achieved

The Gold Award

Services to Humour

British Theatre

Figure 4.
A certificate based on a pre-defined 'gadget' in PenDown DTP.

TextEase has limited page layout tools but only because it needs so few! Type in text where you want it to go, drop a graphic where you want it on the page, add a border or a drop shadow wherever you need one; it's all very flexible. However, there are no facilities for defining how text runs around graphics, which is a pity as it has to be done manually.

TextEase's text handling is also very good indeed. You can use styles or effects to change the font, weight or size, add in a drop shadow, and many other attributes; and text can be rotated whilst remaining fully editable. If you are creating a headline, for example, that requires text in a box, a frame can be positioned around the text with just two clicks of the mouse.

TextEase 2 allows you to import sprites (and JPEGs if you have RISC OS 3.6) and Draw files only. These can be rotated, and TextEase supports OLE between Draw and Paint (as well as Dalriada's *TableMate* and *DiagramIT*, and iSV's *TableCalc*). TextEase2 provides portrait and landscape printing options, as well as supporting for posters and banners.

PenDown DTP

This summary is based on a preview copy of this new package; a fuller review will appear in a future issue. The program is essentially *PenDown* (a word processor) with elements of *FirstPage*, (a DTP package) rolled into one. PenDown DTP is supplied with borders, clip-art, frames, predefined sheets etc. and a manual which is detailed, very clearly laid out and easy to use. Like TextEase 2, PenDown DTP has a speaking option, and the package imports both PenDown and FirstPage documents. The basic requirements are 2Mb of RAM and RISC OS 3.1 or greater; the program can be run from floppy disc, but installation on a hard disc is recommended, and requires 2.3Mb of free space.

As far as ease of use is concerned, PenDown DTP can be configured to one of three levels, each with a different button bar. Although PenDown DTP is a frame-based program, at level one the frame appears as you start typing (or import a graphic), and in all levels the frames expand as the text is entered. The position and size of the frames are altered by using the Select and Adjust mouse buttons. Figure 4 was created using a predefined 'gadget' or page called *Certificate*. I admit to spending a fair amount of time with the manual, but I know that PenDown users will find themselves in a very familiar environment. My initial thoughts are that it is a reasonably easy program to use.

Like all the packages discussed here, PenDown DTP handles text via both styles and effects. There are options for justification and line spacing but not rotated text. As for graphics, Draw and sprite files are simply dropped onto the canvas and dragged to the position required. You can enlarge or crop and rotate as required. All the expected options for printing are there: normal, fitted, pairs, tiled, etc, as well as options to print either odd or even pages and batch printing. The higher the level selected, the greater the number of options.

Conclusions

As a regular user of Impression Publisher (which will be covered next time), I found it interesting to see what the rival products could do; and I must say that I was very impressed. There is no doubt that the Acorn platform is well endowed with packages of this kind. The quality of the four programs under scrutiny here is excellent, and any would suit the requirements of a beginner to or the occasional user. So which package should you consider? Impression Style is the choice for simple layout with complex text, Ovation leads the field for complex layouts, TextEase 2 is excellent because of its ability to create complex effects, and PenDown DTP is the best upgrade option for users of PenDown or FirstPage.

Summary

Impression Style

For

Easy to use, with a user-friendly button bar Excellent text handling Very good graphics handling options

Against

Limited page layout tools No rotated text

Overall

A good investment, with the option to upgrade to more complex and professional versions

Ovation

For

Excellent page layout tools Good text handling Good image import options

Against

No button bar No rotated text

Overall

A good starting point, with a clearly defined upgrade path

TextEase version 2

For

Easy to use, with a user-friendly button bar Excellent text handling Easy-to-use page layout options Fully editable rotated text

Against

Limited image import options

Overall

My favourite of the four! A brilliant 'click and play' concept makes it very ease to use for beginners and schools users; it is also a useful addition for the more experienced user (especially the Impression range)

PenDown DTP

Overall

I have not listed good and bad points, as this would be unfair with a preview copy. However, it is a program that builds upon its heritage and, even in a pre-release form, appears to have the potential to serve users well.

Product information

Product	Impression Style
Supplier	Computer Concepts Ltd Gaddesden Place Hemel Hempstead Herts HP2 6EX Tel. 01442 351000 Fax 01442 351010
Email	info@cconcepts.co.uk
Price	£99.00 ex. VAT

Product	Ovation
Supplier	Beebug Ltd 117 Hatfield Road St Albans Herts AL1 4JS Tel. 01727 840303 Fax 01727 860263
Email	sales@beebug.co.uk
Price	£69.00 ex. VAT

Product	TextEase version 2 & Talking TextEase
Supplier	Softease Ltd The Old Courthouse St Peter's Church Yard Derby DE1 1NN Tel. 01332 204911 Fax 01684 772922
Email	sales@softease.demon.co.uk
Price	TextEase V 2: £49 ex. VAT Talking Textease: £65 ex. VAT

Product	PenDown DTP
Supplier	Longman Logotron Limited 124 Cambridge Science Park Milton Road Cambridge CB4 4ZS Tel. 01223 425558 Fax 01223 425349
Price	£59.00 ex. VAT

DTP News

Ovation and Ovation Pro

By the time you read this, Beebug should have launched the long-awaited *Ovation Pro*. The initial release, which lacks a few more complex features such as colour separations, will be followed by a full release with all the advertised features. If sales exceed their targets, then facilities never before seen in an Acorn DTP package may well be developed and incorporated. Support will continue for the original *Ovation* package: it will be updated to run on future versions of RISC OS, but no new features will be added.

……

PenDown DTP

Longman Logotron has dropped the *FirstPage* DTP package in favour of the new *PenDown DTP*, a package that has all the proven word processing features of *PenDown* together with the DTP features of *FirstPage*.

……

Font Directory 2

LOOKsystems, developer of the first Acorn font filing system, *Font Directory*, has released *Font Directory 2* with even more features. Also expected soon is a version suitable for use in a network environment.

……

T-J Reproductions: new premises and training facilities

T-J Reproductions, the best-known Acorn repro house, is moving to larger premises. Its address and telephone number will, however, remain the same. These larger premises will allow Tony Tolver, head of the company, to offer DTP training to any Acorn computer user. He will be covering all the mainstream Acorn DTP packages as well as how to set out your designs to ensure the best results when they are output.

Wimp Topics: A Bit of a Squash

Alan Wrigley explains how to use the Squash module to compress and decompress files from within your own programs

Most of us are familiar with Acorn's *Squash*, which enables you to compress and decompress files. It is usually used in the form of the *Squash* desktop application, but the work is actually done by a module which is resident in RISC OS from version 3.0 onwards, and therefore available for all programs to use. This article will show you how to make use of it.

For some applications, the ability to compress and decompress files on the fly is very useful. Take a program that cycles through a sequence of pictures. Two good examples are *Desktop Carousel* (RISC User 7:6) and *Backer* (Volume 8 Special Disc), both of which display a sequence of sprites which are stored within the program's resources. Sprite files can usually be compressed quite well, so if the images can be filed in a compressed form and only decompressed in memory just before being displayed, this could save quite a bit of disc space. In fact, *Backer* already does take advantage of squashed files, and an updated version of *Carousel* that does likewise is on this month's magazine disc.

Another example might be a program that stores data in large files. By compressing the data when saving, again disc space might be saved.

Squashing it all in

Using the Squash module is quite simple, requiring just one SWI call ("Squash_Compress", &42700) to compress data, and another ("Squash_Decompress", &42701) to decompress it. However, memory management can be a bit fiddly. The ideal situation is where you have enough RAM available to store all the input and all the output data in memory at the same time (plus some extra which the Squash module needs for workspace). If you can do this, the whole process is quite fast and efficient. If not, then you have to work with a section of the data at a time, and this then brings attendant problems of shuffling data in and out of files as the operation progresses. Nevertheless, this does mean that you can use the facility on virtually any machine regardless of the size of the files being worked on.

The format of a Squash file is straightforward. It has a filetype of &FCA ("Squash"), and consists of a 20-byte header followed by the data in the original file compressed by an LZW algorithm. The header is made up of 5 words as follows:

```
  bytes 0-3: the characters "SQSH"
(&48535153)
        4-7: length of original file
       8-15: filetype and datestamp
      16-19: zero
```

The filetype/datestamp information is exactly as it appears in the file itself; i.e. the first word holds the filetype in bits 4-9 and the top byte of the datestamp in bits 0-3, while the second word holds the rest of the datestamp.

The first step in loading a squashed file is therefore to check its filetype for &FCA, then check that the file starts with *SQSH* and that the filetype is a type that you can handle. This can be done by opening the file and reading in the header.

Once you have determined that the file is of a type you can handle, you then need to set up the parameters for the SWI calls to the Squash module. Assuming for the moment that you have enough memory to perform the whole operation in RAM, then first of all you should load the remainder of the file (the part following the header that contains the data) into a block of memory. You could use the RISC User Heap Manager to claim a block after using OS_File 17 to determine the length of the Squash file. We will refer to this as the input buffer.

Secondly you need a second block (the output buffer) to hold the decompressed data. This needs to be as long as the original file, so you use the value given in the header to claim your block. And thirdly, you need a further block of workspace for the SWI call. You can find out how much you need by making a preliminary call to Squash_Decompress as follows:

```
  SYS "Squash_Decompress",8,<inputsize
> TO wsize%
```

where *inputsize* is the size of the data you have put into the input buffer. The size of workspace required is returned in *wsize%*.

Armed with this information you can now call Squash_Decompress again, this time with parameters set up as follows:

```
R0 = flags
R1 = workspace pointer
R2 = input buffer pointer
R3 = input data size
R4 = output buffer pointer
R5 = output buffer size
```

The flags are as follows:

```
Bit 0: 0 = start new operation
       1 = continue existing operation
Bit 1: 0 = end of input
       1 = more input to follow
Bit 2: 1 = all data will fit into output
           buffer (allows faster algorithm)
Bit 3: 1 = return workspace size (as used
           above)
```

all other bits zero

On exit, R2 and R4 point to the first unused byte in their respective buffers, while R3 and R5 show the number of unused bytes in the buffers. This information may be useful when compressing files, as we will see later. It may also be needed if you are working with memory constraints and are not performing the whole operation in one go.

You can see from this that in cases where memory is tight, you can decompress sections of the data by loading them in one at a time and using the bits in R0 to indicate to the module what is happening.

Squash practice

Let's put all this theory into practice with a procedure that loads a sprite file into a program. We will assume the procedure is called on receipt of a Wimp *Message_DataLoad*, i.e. a file is dragged to the program's icon. There are two parameters: a pointer to the filename, and the filetype. To make it flexible, the procedure will load both squashed and unsquashed sprites. It requires a 20-byte block to have been dimensioned at *head%*, and it also uses the RISC User Heap Manager (the static version from 7:5) which supplies the procedures *PROCallocate* and *PROCdeallocate*, so the following code is needed during initialisation:

```
appsize%=HIMEM-&8000:heap%=0:DIM head% 19
spr%=0:SYS "OS_ReadMemMapInfo" TO page%
```

You also need an error-reporting procedure of some kind which is called at line 1110. The whole routine will be explained afterwards.

Listing 1

```
1000 DEFPROCload(name%,type%)
1010 SYS "Hourglass_On"
1020 SYS "OS_WriteN",name%,0 TO file$
1030 SYS "OS_File",17,file$ TO ,,,,len%
1040 errflag%=0
1050 CASE type% OF
1060  WHEN &FCA:PROCgetsquashed
1070  WHEN &FF9:PROCmemalloc(len%+4)
1080  SYS "OS_SpriteOp",266,spr%,file$
1090  OTHERWISE:errflag%=TRUE
1100 ENDCASE
1110 IF errflag% PROCreport(“Not a sprite file”,1)
1120 SYS "Hourglass_Off"
1130 ENDPROC
1140 :
1150 DEFPROCmemalloc(x%)
1160 IF spr% PROCdeallocate(spr%)
1170 spr%=FNallocate(x%)
1180 !spr%=x%:spr%!8=16
1190 ENDPROC
1200 :
1210 DEFPROCgetsquashed
1220 file%=OPENINfile$
1230 SYS "OS_GBPB",3,file%,head%,20,0
1240 IF !head% THEN
1250  flen%=head%!4:len%-=20
1260  type%=(head%?9+256*head%?10) AND &FFF
1270  IF type%<>&FF9 errflag%=TRUE
1280 ELSE
1290  errflag%=TRUE
1300 ENDIF
1310 IF NOT errflag% THEN
1320  PROCmemalloc(flen%+4)
1330  SYS "OS_SpriteOp",265,spr%
1340  in%=FNallocate(len%)
1350  SYS "OS_GBPB",3,file%,in%,len%,20
1360  CLOSE#file%
1370  SYS "Squash_Decompress",8,len% TO a%
1380  work%=FNallocate(a%)
1390  SYS "Squash_Decompress",4,work%,in%,len%,spr%+4,flen%
1400  PROCdeallocate(in%)
1410  PROCdeallocate(work%)
1420 ENDIF
1430 ENDPROC
```

The first job to be undertaken is to find the size of the file in line 1030. At this stage we don't know whether it is squashed or not. A CASE statement then sorts out whether the file is a Squash file (&FCA), a sprite file (&FF9) or something else, in which case an error is reported. If it's a Squash file, *PROCgetsquashed* is called. The file is opened and the header read into *head%* (lines 1220-1230). If the header starts with *SQSH* and the original filetype was a sprite, then *PROCmemalloc* is called (1320). This claims a memory block starting at *spr%*, having first deallocated any previous such block if this is not the first file loaded. A sprite area is then set up, a block claimed for the input buffer, and the remainder of the squashed file loaded into it (1330-1350).

The first call to Squash_Decompress at line 1370 reads the workspace size, and this is duly claimed as *work%*. The second SWI call performs the full decompression operation, specifying *in%*, *spr%* and *work%* as the input and output buffers and the workspace respectively. The decompressed sprite should now be in the sprite area at *spr%* ready for use. The input buffer and workspace are then deallocated as they are no longer needed.

If the file loaded is an uncompressed sprite file, it is simply loaded straight into a sprite area at line 1080, having called *PROCmemalloc* as before.

First compressions last

Compressing files is just as simple. In fact, the use of Squash_Compress is more or less identical to the use of Squash_Decompress, except that the input and output buffers now hold the uncompressed and the compressed data respectively, rather than the other way round. Also, the first call with bit 3 of R0 set will return the maximum size of the compressed data in R1 as well as the workspace size in R0. So if you have a block of data that you want to save as a squashed file, of length *datalen%* and located at *store%*, you would use:

```
   SYS "Squash_Compress",8,datalen% TO
wsize%,osize%
   work%=FNallocate(wsize%)
   out%=FNallocate(osize%+20)
   SYS "Squash_Compress",4,work%,store
%,datalen%,out%+20,osize% TO ,,,,end%
   ?work%=3:SYS "OS_Word",14,work%
   !out%=&48535153:out%!4=datalen%
   out%!8=&FFF00000+(filetype%<<8)
+work%?4
   out%!12=!work%:out%!16=0
   SYS "OS_File",10,filename$,&FCA,,
out%,end%
```

Here we have used the workspace, which is redundant after the compression, as a buffer to get the time as a 5-byte value using OS_Word 14,3. This is then placed into the correct bytes in the header before saving the squashed file.

Losing your head

One thing to bear in mind is that the Squash file header is only relevant if you are compressing an existing file which may need to be restored to its original format later. The Squash module itself knows nothing about headers and simply works on the data, so if you are using it within a program to store data files which will only be read by that program, there is no need to include a header. You can just save the compressed data straight out to a file. This will act as a limited form of protection, too. Although an experienced hacker could get at the information quickly enough, the compressed data would appear to be encrypted to the untrained eye, and would prevent casual inspection of sensitive data.

Stretching time

Compression and decompression obviously take a little time to perform. The faster your processor, the quicker the process will be. Also, as I have said earlier, it is considerably faster if you can allocate enough memory for the whole operation to be done in one go. For decompression, Acorn quotes figures for an ARM2 of approximately 48Kb per second when done piecemeal, and 280Kb per second if done in one go. Most people nowadays have faster processors, and on my ARM610 I found that decompression of a 400K sprite in memory took about one-fifth of a second (i.e. about 2Mb per second). Compression is rather slower, and will probably take between 2 and 4 times as long depending on the method used.

Although in most cases the extra time will not cause problems (an extra fifth of a second to load a sprite is neither here nor there), there will be some cases where it might be noticeable; for example, a desktop carousel running at a fast rate with large sprites. The updated version of *Carousel* on this month's magazine disc attempts to get round this by loading sprites as soon as the previous one has been displayed, instead of when they are about to be displayed.

While on the subject of speed, you may notice if you use the routines listed here (which are packaged up into a small application on the magazine disc), that if you load a subsequent file after having previously loaded a squashed file, the process seems to take much longer. This is because of an inefficiency in the Heap Manager's deallocation routine that I have only just spotted. I will deal with this in a future article.

A Blast from the Past

Mark Sealey tests a 6502 Emulator for the Risc PC and Archimedes

You'd better believe this! *Stig of the Dump, Worst Witch, ViewSheet* or even *Snapper* and *Elite*... not to mention sideways ROMs (and RAM) on your mouse-driven 32-bit Acorn RISC machine? Yes, indeed!

You will have heard of the ARM chip; but what is the 6502? Well, in the days of the original BBC and Master computers (from 1982 onwards), two chip families dominated the microcomputer chip market: the Zilog Z80 and the Rockwell 6502. The latter was the 8-bit 'brain' of the original BBC and Master computers. Some of us even learned to program it, for it was more common ten years ago (and more necessary, indeed) to write simple programs to achieve specific ends (say, for kids having difficulties with left-right orientation or colour recognition) in BASIC or 6502 Assembler.

Now software to emulate the 6502 (and hence the BBC operating system) has been released by Warm Silence Software. In theory, this should allow anyone with the 32-bit Archimedes, A-series or Risc PC machines to run software originally written and sold for use on BBCs, the Master or Master Compact, though if you use a Risc PC, you will need to have your titles transferred onto 3.5" discs, as the latest Acorn machines cannot support 5.25" disc drives.

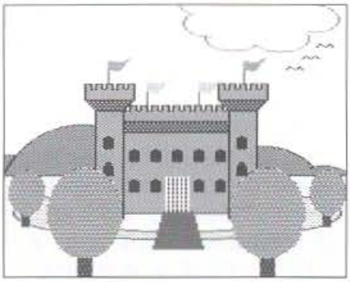
Many schools are in this position; indeed, the new emulator will certainly appeal to many Acorn primary schools: incredibly, the most common item of hardware still in use in UK schools at the end of 1995 (in numbers of units) was the 8-bit BBC Micro, which accounted for roughly 50% of all machines! At least one major distributor claims that the bulk of their business is still in 8-bit titles.

The different machines and operating systems emulated by 6502Em

Consequently, you may well still be using the older system, particularly if you work in a primary (or perhaps special) school. Certain of the computer education magazines occasionally recommend such-and-such a piece of software which is likely to be 'hanging around somewhere' ready to be used; now you really can use it!

Installation

The product comes on a single floppy with most of the files archived; these need to be uncompressed carefully onto another disc. The emulator can cope with several types of machine: BBC Micro, Master 128 with the first or second release of the Master operating system, Master Compact and, soon, Electron. However, the necessary ROMs are only easily available for the BBC Micro. Copies of the appropriate files can be taken from Acorn's own limited emulator, *!65Host* (a copy is supplied), but if you wish to emulate one of the other machines, you will have to obtain the necessary ROM images from a real computer; instructions and utilities for doing this are provided.



6502Em is launched in the usual way, and sits on the icon bar as you would expect. Clicking on it with Select or Adjust puts you into the full-screen 8-bit environment, whilst clicking with Menu leads to a menu of various options, including patches for some of the popular games, a list of installed ROMs, and save options for a snapshot of the emulator's memory or a sprite of the screen (though teletext screenshots cannot be saved). Various options can also be edited, such as keyboard mapping, the type of machine being emulated (if you have more than one set of ROMs) and so on.

The documentation consists of a series of text files (with an index explaining what each contains) which go into just enough technical detail for the average user to be

6502Em	
Supplier	Warm Silence Software St Catherine's College Oxford OX1 3UJ Tel: 0585 487642
Email:	Robin.Watts@comlab.ox.ac.uk
Price	£15 all inclusive

able to make changes and customise the software; they cover nearly everything that you would want to know, except which original BBC/Master products will run. You would be advised to drag up from 10 years ago what you remember about BBC BASIC, as occasionally the odd line in a program, say a variation on the powerful VDU23 command, is encountered and has to be changed. Those were the days!

In operation

To launch a BBC file, you can double-click on it from the desktop; this runs the emulator and starts off your 8-bit session. Once inside the 6502 emulator (it is like entering another world), everything will either be very familiar (if you are used to the BBC/Master machines) or quite disorienting: the keys behave differently for a start; the asterisk (*) is no longer above 8, but where @ is on the Risc PC. You can edit the mapping, though the instructions on how to do this are limited.

But the main aim of an emulator is the smooth and transparent running of software intended for another environment, and this is what the product achieves. The emulated (non-hierarchical) DFS works under ADFS, and even some protected discs run. Various machine-specific features such as hardware interrupts and hardware scrolling (important for games) work well. There were one or two minor bugs, and I found that the Risc PC could hang occasionally; but in most respects, the software tested ran properly, allowing children to work without a hitch at these older programs. The product's attempts to emulate the (at the time quite sophisticated) capabilities of the BBC's sound system are also successful.

Conclusions

This is a well-written and attractively-produced utility that performs its job well; it does the developers credit that they have considered it worthwhile to market a product of relatively limited appeal at such a reasonable price!

Amongst Archimedes and Risc PC users to whom it could be recommended are those who miss being able to sit up late at night playing the classic games never versioned for the later machines. School users who have upgraded, or are considering upgrading, to the 32-bit series, and who have 8-bit titles which they still need to use, will find the product invaluable, as they will not have to abandon their old software from the likes of ESM, Sherston, Topologika, 4Mation, Chalksoft and MEP.

So, do you believe me now? Nor is this an April Fool's wheeze: the same company also has a Z80 emulator if you enjoy this sort of thing!

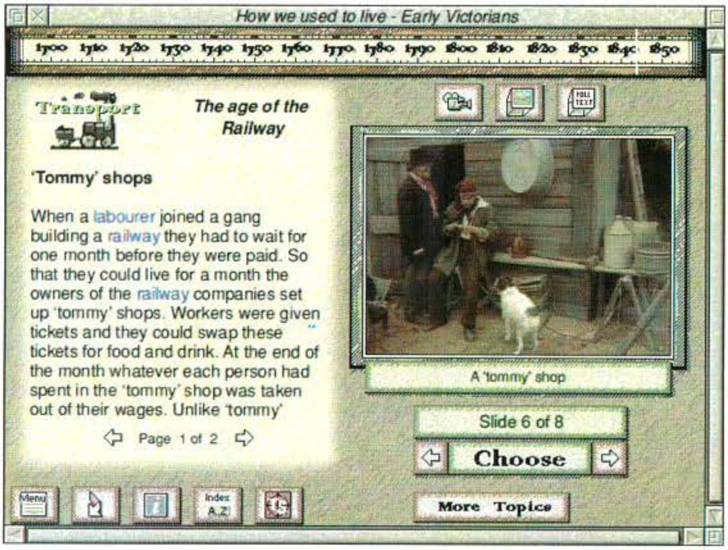
Competent, Functional, Effective

Chris Drage takes a look at some of the most outstanding educational releases from BETT

I am constantly being reminded by PC folk of the huge number of CD-ROMs available, globally, for Windows, most of which have, in fact, found their way across the Atlantic. I get to see a lot of those titles which purport to be educational; in many cases they turn out to be 'edutainment' rather than a useful source of information and learning, and usually contain a heavy cultural bias to boot. A good multimedia resource should not have to rely on blurring the distinction between being entertaining and being a serious educational tool; and by 'serious', I don't mean being stuffy and lacking in motivating features. The number of titles available for Acorn machine is small by comparison, but where there is a perceived lack of quantity it is certainly made up for by quality, as this month's post-BETT roundup shows. This is but a small sample of titles on display at BETT, yet each represents a major resource in its own field.

Past times

How we used to live: Early Victorians is the latest in a CD-ROM series based on the successful and popular schools television series, *How we used to live*, produced by Yorkshire Television. Using both factual information dating from 1700 and a fictional recreation, *Early Victorians* provides an insight into one of the most glorious periods of British history. It has been developed specifically to meet the National



The age of the Railway

'Tommy' shops

When a labourer joined a gang building a railway they had to wait for one month before they were paid. So that they could live for a month the owners of the railway companies set up 'tommy' shops. Workers were given tickets and they could swap these tickets for food and drink. At the end of the month whatever each person had spent in the 'tommy' shop was taken out of their wages. Unlike 'tommy'

A 'tommy' shop

Learning about the age of steam in How we used to live: Early Victorians

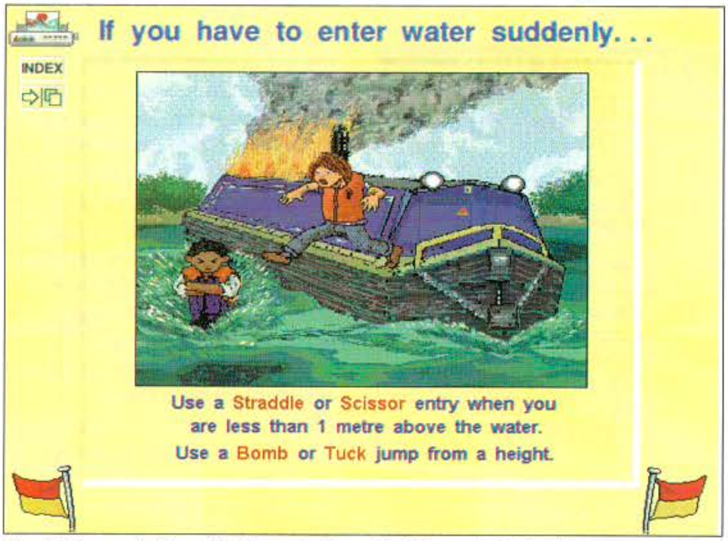
History Curriculum requirements for 8- to 11-year-olds.

The CD uses hundreds of images, some of which date from the 18th and 19th centuries, audio, video, animation and text to graphically illustrate British history from 1700 to 1850. There are three ways in which the information on the disc can be accessed: through the *Slide Show* section, the *Time Chart* and the *Index*. Also available is a biography section that gives additional information on the fictional characters that are introduced along the way. Using a combination of narration and full colour images, Slide Show tells the story of the Coggans and Harraps, families which feature in the television series.

The wide variety of characters are used to illustrate what everyday life was like for people of all ages in Victorian Britain. The *Biographies* section enables you to find out more about each character's life. Also linked to the Slide Show is *Investigating History*, which contains all the factual information included on the disc, divided into the six study areas specified in the National Curriculum. It combines text written especially for primary pupils with hundreds of colour and monochrome images, audio clips, animation and fictional key scenes, and the user can discover all about industry, transport, education, domestic life, leisure and working conditions in Britain from 1700 to 1850. There is even a *TrailSave* feature which allows children to bring together information from different parts of the disc. To accompany the CD-ROM and the video and TV series is set of 40 worksheets which cover all the main areas of study and range from close procedure passages to spider diagrams and finding historical evidence. What makes this CD stand out is its attention to detail and the snug way it sits in a group of related resources. Look out for *How we used to live: Late Victorians*, which will complete the set. Excellent stuff!

Like a duck to water

Essential Steps to Swimming is a milestone in its own right, being the first Physical Education CD-ROM to appear which aims to support the National Curriculum's requirements for swimming and water safety. But it is wholly suitable for any adult or child (beginners and improvers); there are many entry points. Beginners can start with water confidence games and work through sequentially, whilst improvers can go directly to a particular stroke they need. Teachers and instructors can dip into a more detailed breakdown of a stroke. For swimmers, any one of four strokes can be chosen from the menu. Floating is introduced, then gliding, before front crawl is attempted. Later, water safety and survival techniques or more advanced techniques such as turning follow.



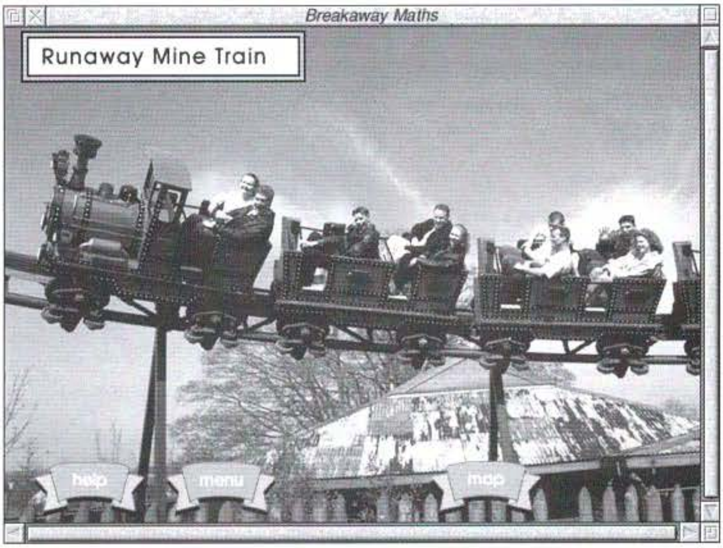
Use a Straddle or Scissor entry when you are less than 1 metre above the water.
Use a Bomb or Tuck jump from a height.

Useful tips on falling off a barge in Essential Steps to Swimming

There are plenty of animations demonstrating gliding, floating and the components of each stroke. The animations are particularly well presented, with a single step-through feature which is very helpful in order to highlight a particular part of a stroke. Each learning point clearly relates to action, so that instructions given at the pool can be revised and understood more clearly at the computer afterwards. For reinforcement there are interactive word games and quizzes (multiple-choice with digitised speech and sound effects) to test knowledge. Apart from some rather jerky video clips which tend to detract from any appreciation of the stroke, all the material is very sound indeed. Not surprisingly, *Essential Steps to Swimming* has been received enthusiastically by both the ASA and RLSS. Swimming is an essential acquisition for everyone. From beginners to children at club level, or for adult learners, *Essential Steps to Swimming* is an essential aid.

PRODUCT INFO

Product	How we used to live: Early Victorians
Price	£59.99 ex VAT
Product	Essential Steps to Swimming (dual format version Acorn and PC)
Price	£53.58 ex VAT
Product	Breakaway Maths
Price	£65.00 ex VAT
Supplier	Yorkshire International Thomson Multimedia Ltd The Television Centre Leeds LS3 1JS Tel. 0113 243 8283 Fax 0113 243 4884



Breakaway Maths: all the fun of the fair in a maths lesson

Making maths digestible

Turning to mathematics, I taught Year 3 maths for six years prior to this current school year, and pupils who struggle at National Curriculum Level 2 have always posed a problem. The school's usual remedy is to withdraw the struggling ones for some extra help involving a part-time teacher. Although this is fine in part, it does not suit all children, particularly boys, who can end up resenting this intensive work. Here, *Breakaway Maths* can come to the rescue. Aimed fairly and squarely at children who are not attaining well at levels 1 to 3 in mathematics, *Breakaway Maths* features a much brighter and highly stimulating approach. It is set in the context of Alton Towers Theme Park, and is packed with video footage and high quality still photographs. The CD provides a host of stimulating maths activities relating to number, shape/space, algebra and handling data, all set in real-life situations.

Each child is assessed on entry into the theme park and then navigates round it using an on-screen map with the assistance of older child-guides. Extensive use of audio is made to explain what to do and where to go. At various locations (rides, etc.) either a mathematical activity or a problem-solving investigation is presented to the pupil. At many locations, investigative work is carried on away from the computer altogether. Each child's visit is password protected so he or she can continue from their current location in the park. What I like particularly is the way in which the software adjusts the level of difficulty according to the performance of the pupil and the continuous assessment it provides. At any point, the teacher can gain entry to the records and see each pupil's progress recorded graphically in terms of their performance, with each particular activity covered. *Breakaway Maths* addresses a narrow band of levels in National Curriculum mathematics, but does it extremely well. I wish I had had this one years ago! As a caring, involved parent you should seriously consider this CD-ROM for home use: I can see it being employed very well with struggling 11-year-olds. Just check with your child's teacher first that he or she is not likely to use it in the course of the school's maths programme.

Conclusion

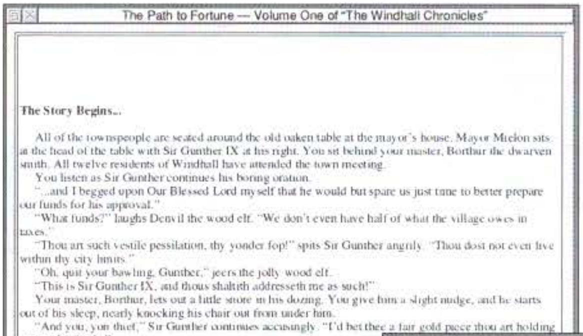
Well, that's only three titles; I could have described a dozen more which are of equal quality and value. When it comes to CD-ROMs, British publishers know best how to match these resources to the realities of the education system and culture. Check them out first!

The Lost Treasures

Alan Bonsor ventures into an interactive world of mystery, fantasy and science fiction

You had been rudely awakened this morning. The radio-alarm beside your bed had burst into life, its volume high enough to drown out the remnants of last night's office party still throbbing in your head, and by some cruel coincidence the postman had chosen that very same moment to launch the door bell into another painful rendition of Greensleeves.

It is now midday; the cat is glaring at you from the corner of your study, making clear its displeasure at having been the purely unintentional target of the airborne radio, and in addition to a hangover you are nursing a sprained ankle which you feel quite justified in blaming on the postman. On the kitchen counter in front of you is a glass tumbler containing a creamy red mixture, a pile of unopened mail and a rather large parcel, tightly wrapped and sealed.



The Path to Fortune — Volume One of "The Windhall Chronicles"

The Story Begins...

All of the townspeople are seated around the old oaken table at the mayor's house. Mayor Mielon sits at the head of the table with Sir Gunther IX at his right. You sit behind your master, Borthur the dwarven smith. All twelve residents of Windhall have attended the town meeting.

You listen as Sir Gunther continues his boring oration.

"...and I begged upon Our Blessed Lord myself that he would but spare us just time to better prepare our funds for his approval."

"What funds?" laughs Denvil the wood elf. "We don't even have half of what the village owes in taxes."

"Thou art such vestile pessilation, thy yonder fop!" spits Sir Gunther angrily. "Thou dost not even live within thy city limits."

"Oh, quit your bawling, Gunther," jeers the jolly wood elf.

"This is Sir Gunther IX, and thous shaltith addresseth me as such!"

Your master, Borthur, lets out a little snore in his dozing. You give him a slight nudge, and he starts out of his sleep, nearly knocking his chair out from under him.

"And you, yon thief," Sir Gunther continues accusingly. "I'd bet thee a fair gold piece thou art holding out on thy funds."

Kytan, the town trader and well-known thief, glares from under the

[MORE]

Jeff Cassidy's Windhall, written in 1995, demonstrates that the Infocom spirit lives on

`examine parcel`

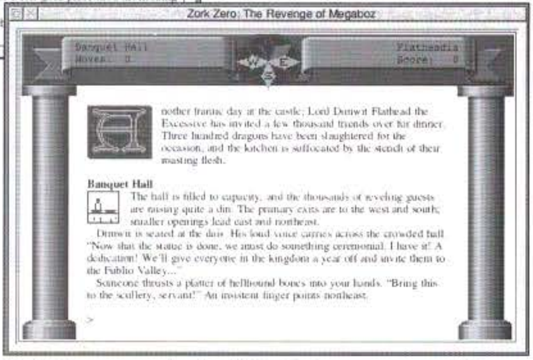
As you lean forward to take a closer look at the parcel your head starts to swim and your stomach performs a very unpleasant somersault. You realise that you're in no fit state to be awake, let alone to examine the post.

`drink red mixture`

You unsteadily pick up the glass, close your eyes and knock back its contents. The two eggs, tomato juice and dash of tabasco take effect almost immediately and your brain and stomach reach a fragile state of equilibrium.

`examine parcel`

You pick up the parcel. It's big, heavy, and covered in several layers of packing tape with a label addressed to you attached to one side. You extract a pair of scissors from a drawer to your right and carefully slice through the tape. You peel back the sticky mess of tape and wrapping paper to reveal two large boxes and a leaflet. The two boxes declare themselves to be:



Zork Zero: The Revenge of Megaboz

Banquet Hall
Moves: 0

Flatheadia
Score: 0

Another frantic day at the castle; Lord Dimwit Flathead the Excessive has invited a few thousand friends over for dinner. Three hundred dragons have been slaughtered for the occasion, and the kitchen is suffocated by the stench of their roasting flesh.

Banquet Hall

The hall is filled to capacity, and the thousands of reveling guests are raising quite a din. The primary exits are to the west and south; smaller openings lead east and northeast.

Dimwit is seated at the dais. His loud voice carries across the crowded hall: "Now that the statue is done, we must do something ceremonial. I have it! A dedication! We'll give everyone in the kingdom a year off and invite them to the Fublio Valley..."

Someone thrusts a platter of hellhound bones into your hands. "Bring this to the scullery, servant!" An insistent finger points northeast.

>

Zork Zero - one of a handful of Infocom games which supports graphics

The Lost Treasures of Infocom I and II

`read leaflet`

Congratulations on purchasing The Lost Treasures of Infocom I and II - an anthology of 31 of the greatest interactive text adventures even written. Created between 1977 and 1989, these adventures turned Infocom into one of the most respected companies in the market. At its height in 1985 Infocom employed over 100 staff, had a turnover of $10 million, and participated in the excesses of the 80s. When it launched Suspect *in that year for example, it hired a mansion and invited 5,000 people to a murder party.*

Although Infocom released its final game in 1989, interest in its adventures has never entirely died, unlike most other games from that period. This is all down to the fact that every one of Infocom's games is like a good novel: captivating, enchanting and timeless.

The last couple of years have seen a strong revival in demand for text adventures and Activision, who owns the rights to the Infocom

The Lost Treasures of Infocom 1 and 2

Supplier	Interdata Developments 6 Okeover Road, Salford, Manchester M7 4JX Tel. 0161 7922871 Fax 0161 7922114
Price	The Lost Treasures I: £29.95 inc. VAT The Lost Treasures II: £25.95 inc. VAT

games, has repackaged almost all of them in these two superb collections.

Every Infocom game ever published was supplied with a collection of fictitious atmosphere-setting goodies which added depth, background and a great deal of humour to the games. These included booklets, badges, maps, sunglasses, newspapers, telegrams, and so on.

With *Suspect*, in which you, a journalist, are framed for a murder at a halloween party, came a booklet entitled *Murder and Modern Manners*, an invitation to the party, a note from the editor of *The Washington Representative* newspaper suggesting a possible angle for you to cover, a page from *The Maryland Countryside* magazine providing some possible reasons for the murder, a business card containing a rather incriminating message, and a receipt from *Costumes Unlimited*.

Replicas of almost all of these items are supplied in *The Lost Treasures of Infocom* packages. Lost Treasures I comes with a 270-page manual containing copies of all the original printed material and 19 A3-size maps, as well as an even larger hint book for when the going gets tough. Lost Treasures II comes with a 126-page manual and a selection of maps and brochures. These manuals and brochures are entertaining and enjoyable in their own right, and can easily be read from cover to cover. Many of the illustrations are absolutely brilliant and the text is filled with humour.

The Lost Treasures of Infocom I consists of the following games: *Zork* I, II and III, *Zork Zero* and *Beyond Zork*, *Enchanter*, *Sorcerer*, *Spellbreaker*, *Infidel*, *Suspect*, *Ballyhoo*, *The Lurking Horror*, *Deadline*, *Witness*, *Moonmist*, *The Hitchhiker's Guide to the Galaxy*, *Starcross*, *Planetfall*, *Stationfall* and *Suspended*.

Infocom Classics Anthology
The Lost
Treasures
of Infocom
II
Wishbringer
A Fortune in Interactive Adventures!
Infocom

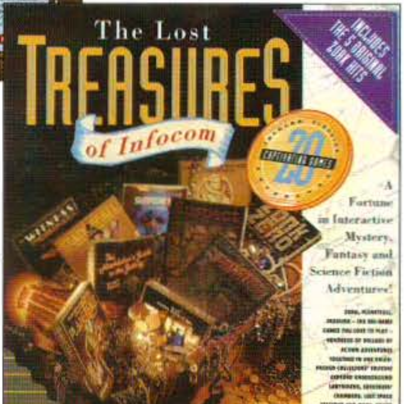
The Lost Treasures Of Infocom II contains the following: *Border Zone*, *A Mind Forever Voyaging*, *Plundered Hearts*, *Bureaucracy*, *Cutthroats*, *Hollywood Hijinx*, *Seastalker*, *Sherlock*, *Wishbringer*, *Nord and Bert Couldn't Make Head or Tail of It* and *Trinity*.

What is Zip 2000?

In order to play these games you will need what is known as a Z-Code Interpreter. Several of these are available for Acorn computers and you'll find one, *Zip 2000*, on this month's magazine disc. It is an interpreter for Z-code programs, which includes all the Infocom adventures and games created using Graham Nelson's *Inform* adventure compiler.

Zip 2000 is the most comprehensive Z-code interpreter available for Acorn computers, supporting all eight game versions as well as graphics, sound, colour, mouse control, timed input and foreign languages (including runes). Though normally freeware, we are presenting a special RISC User edition of the program on the magazine disc, with numerous extra features such as command recall and editing and a choices of fonts. We are also including a couple of games by Graham Nelson.

Some Infocom games support limited graphics and sound, *Zork Zero* being an example of the former and *Sherlock* and *The Lurking Horror* of the latter. The Lost Treasures packages do not include any of the sound or graphics files, as the games work fine without them. The missing files can be obtained over the Internet from the Infocom/Inform FTP site. At this site you will also find a selection of free Inform-produced adventure games, including the absolutely brilliant *Windhall Trilogy* by Jeff Cassidy, Graham Nelson's *Jigsaw* and *Christminster* by Gareth Rees.

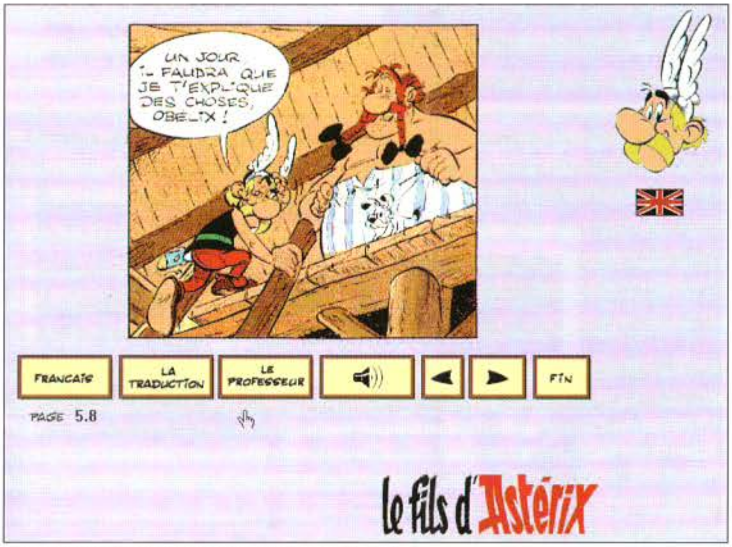

The Lost
Treasures
of Infocom
Includes the 5 original Zork hits
20
A Fortune in Interactive Mystery, Fantasy and Science Fiction Adventures!
Infocom

The full address for Infocom/Inform FTP site is: ftp.gmd.de:/if-archive/infocom. The new RISC User PD 01 disc contains a selection of the games from this site.

PC Matters

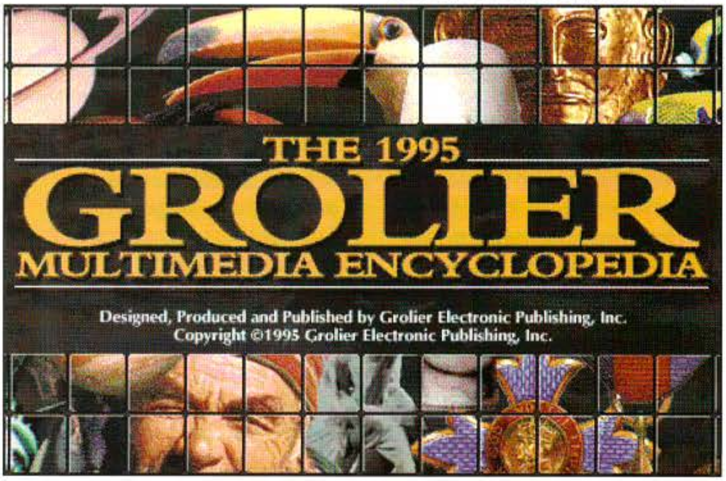
Alan Bonsor examines the practical uses for your PC card

A recent debate on one of the Acorn Internet newsgroups once again focused on whether or not Acorn newsgroups and magazines are appropriate places to discuss and examine PC related topics; running reviews of PC software and providing a forum for PC card users to discuss problems and solutions, for example. Those opposed to this new and increasing trend felt that Acorn newsgroups and magazines should remain specific to Acorn products, dealing only with those products that are designed to run on the ARM processor, their argument being that if one wants to read reviews of PC software, one should purchase one of the numerous PC magazines. Those in favour argued that the newsgroups and magazines are there to help the user, to provide information about and help with software and hardware that users want or need to run on their Acorn computers.



Learn French with Asterix and your PC card

My attitude is that a computer, whether it be a PC, Acorn or Apple, is a tool which is only as good as the software that runs on it. If it enables me to do whatever I want or need to do, then it is a useful tool. Most of my requirements are satisfied by native Acorn applications such as Ovation, Impression, DeskEdit, Zap, Photodesk and Studio 24. These applications, while not offering the vast range of features provided by equivalent PC applications, are easy to learn and use, exceptionally fast, and let me get on with the job in hand. PC 'works' applications (by which I mean word-processors, spreadsheets, databases and so on) are, in my view, cumbersome, over-complicated and tiresome to use. Compared to Acorn applications they are unbelievably memory-hungry and sluggish, even when run on fast Pentium systems. There is, however, a gaping hole in the Acorn software market. There are few, if any, high quality multimedia and reference titles available to run under RISC OS. It is an indisputable fact that PC reference and multimedia titles are the best available. In fact, most recent PC multimedia and reference titles are of outstanding quality, beautifully presented, brimming with information, and remarkably cheap considering what you get. The biggest market for Acorn-badged computers remains the education sector, and schools have to be able to use software such as Microsoft's *Encarta 96* and *Dinosaurs*, EuroTalk's language titles such as *Le Fils D'Asterix*, OUP's



Designed, Produced and Published by Grolier Electronic Publishing, Inc.
Copyright ©1995 Grolier Electronic Publishing, Inc.

The PC Card brings a wealth of information to your Risc PC

Grolier's is just one of several multimedia encyclopedias available for Windows

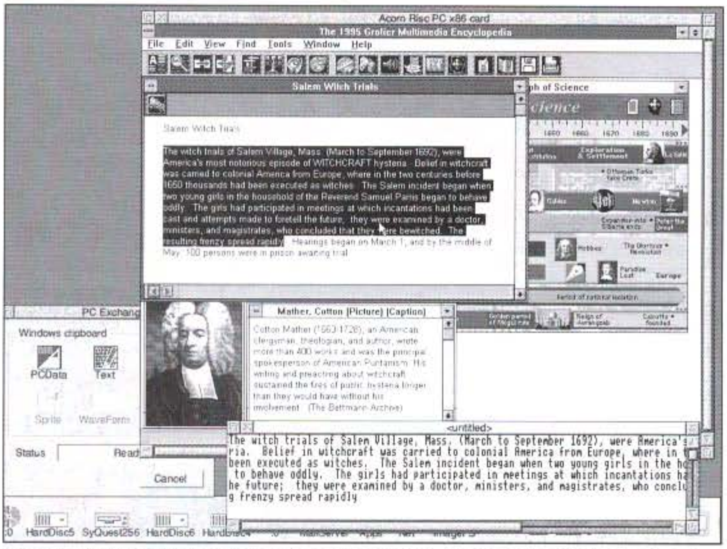
Oxford Study Shelf and *Language Shelf*, and so forth. Innovative Media Solutions is doing a superb job of providing schools with this facility by creating RISC OS readers for the most popular PC titles, but there are still thousands of titles for which readers will never become available, simply because of the time, effort and cost involved.

I personally make extensive use of the *Oxford Reference Shelf* and the *Oxford Compendium*, both packages costing under £40 each. They run under Windows in a window on my RISC OS desktop, multitasking with Impression and Zap, and together contain an invaluable collection of titles including the *Oxford Dictionary for Writers and Editors*, the *Oxford Guide to English Usage*, a *Dictionary of Computing*, the *Oxford Thesaurus* and *Dictionary of Quotations*, and German, Italian, Spanish and French Mini-dictionaries. Even when multitasking Windows like this, searching for information is lightning fast, and with *PC Exchange* I can cut and paste blocks of text with a couple of mouse clicks. I also regularly refer to *Encarta 96*, newspapers such as the Times and Guardian on CD-ROM, and Electronic Arts' *3D Atlas*. Copying an image or piece of text from one of these application's to a Windows application such as Microsoft *Word* is a painfully slow experience, particularly so for images. With PC Exchange I can have the image in Impression in seconds.

My point behind all of the above is this: Acorn didn't make the Risc PC PC-compatible simply because they thought it would be an attractive selling feature. They did it to increase the range of software that could be run on Acorn computers. If you use the PC card for what it does best, to run PC multimedia and reference software, and RISC OS applications to provide the creating, editing and manipulating facilities, you really will have the best of both worlds and you'll get a great deal more out of your Risc PC. If, however, you expect the PC card to turn your Risc PC into something it was never meant to be - an all-singing, all-dancing PC games machine - you will be very disappointed.

PC Hints and Tips

If you haven't yet purchased a modem and an Internet account, it's high time you did so. The Acorn newsgroups make for fascinating reading and contain loads of useful information. Every so often a gem appears, the following being one of them.



Salem Witch Trials

The witch trials of Salem Village, Mass. (March to September 1692), were America's most notorious episode of WITCHCRAFT hysteria. Belief in witchcraft was carried to colonial America from Europe, where in the two centuries before 1660 thousands had been executed as witches. The Salem incident began when two young girls in the household of the Reverend Samuel Parris began to behave oddly. The girls had participated in meetings at which incantations had been cast and attempts made to foretell the future; they were examined by a doctor, ministers, and magistrates, who concluded that they were bewitched. The resulting frenzy spread rapidly. Hearings began on March 1, and by the middle of May, 100 persons were in prison awaiting trial.

Cotton Mather (1663-1728), an American clergyman, theologian, and author, wrote more than 400 works and was the principal spokesperson of American Puritanism. His writing and preaching about witchcraft sustained the fires of public hysteria longer than they would have without his involvement. (The Bettmann Archive)

```
The witch trials of Salem Village, Mass. (March to September 1692), were America's
ria.  Belief in witchcraft was carried to colonial America from Europe, where in t
been executed as witches.  The Salem incident began when two young girls in the ho
 to behave oddly.  The girls had participated in meetings at which incantations ha
he future;  they were examined by a doctor, ministers, and magistrates, who conclu
g frenzy spread rapidly
```

Moving information between Windows and Risc OS is easy with PC Exchange

Windows 95 'stripy icon' fix

To banish Windows 95 stripy icons forever, add the following two lines to the *AUTOEXEC.BAT* file:

```
attrib -h c:\windows\
shelli~1
del c:\windows\shelli ~1
```

They must be inserted before the WIN command, and, if you edit the file under RISC OS, don't forget to add the [0d] character to the end of each line. Whenever you now boot the PC card, the system file which contains the corrupted icon data will be deleted. When Windows 95 starts, the file will automatically be recreated *sans* stripes. The only occasion when the stripes will reappear is if you restart Windows 95 from the *Shutdown* window, in which case the *AUTOEXEC.BAT* file will not be executed so the file will not be deleted.

Sorting files under DOS

If you've ever tried to locate a specific file under DOS, you'll probably have discovered that DOS doesn't bother sorting files when you catalogue a directory. This can be very frustrating when the file in question is in the *WINDOWS* or *WINDOWS\SYSTEM* directory which contain approximately 180 and 460 files respectively. To display the contents of, for example, the *WINDOWS* directory in alphabetical order and to pause between each screenful, enter the following command at the DOS prompt:

```
dir c:\windows |sort |more
```

Selecting the correct keyboard driver

The vertical bar in the above hint is obtained by pressing the Shift and \ keys together. However, on screen the bar must appear as a solid vertical bar, and not as the broken bar on the key. If it appears as the latter, edit *AUTOEXEC.BAT* and change the 850 in the following two lines to 437:

```
MODE CON CODEPAGE PREPARE=((850) C:\DOS\EGA.CPI)
MODE CON CODEPAGE SELECT=850
```

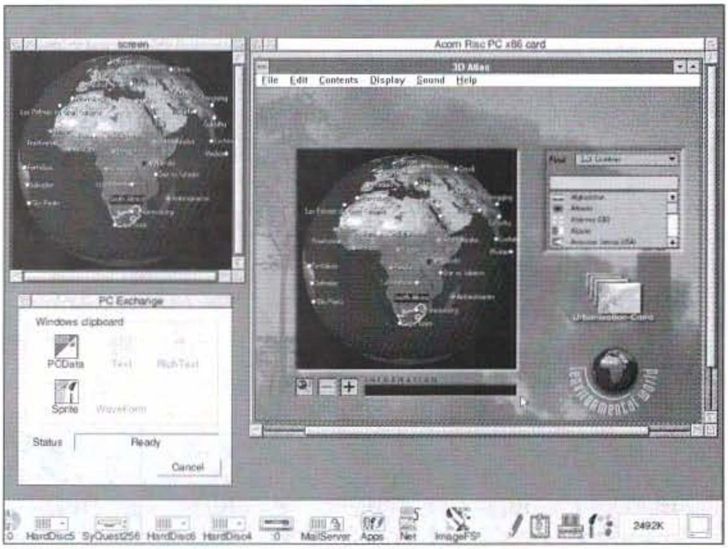
Also ensure that you have the UK keyboard driver selected by checking that the line immediately after the above commands in *AUTOEXEC.BAT* reads

```
KEYB UK,,C:\DOS\KEYBOARD.SYS
```

and not

```
KEYB US,,C:\DOS\KEYBOARD.SYS
```

You can check whether you are using the correct keyboard driver by pressing the # key on the keyboard. If, without Shift, it appears on screen as a \ and with Shift as a |, then you have the US keyboard driver loaded. Simply make the above change to the *AUTOEXEC.BAT* file to remedy the problem.



Electronic Arts' 3D Atlas is an invaluable tool for geography students

Printing from Windows

A number of users have contacted me about problems they have experienced with printing from the PC card; specifically, printing being intermittent, very slow or non-existent. There are two main culprits, and both are closely related. Firstly, if you are using TurboDrivers and the TurboDriver printer cable, you will have a great deal of difficulty getting anything at all from the PC card to the printer. While it is possible to print to a file and then copy the printout file from the PC partition to the RISC OS printer manager, the simplest and most reliable solution is to get a normal PC printer cable and switch cables when you need to print from the PC card. The second problem occurs with the Impression and ArtWorks dongles. If neither of them has been initialised, it is quite probable that the PC card will be unable to communicate with the printer. To solve the problem, run Impression and quit it prior to starting the PC card. Other things to check if you're having problems are that the *Ignore RISC OS Printer stream* and *Allow PC Card to access parallel port directly* options are set in the PC card configuration window, and, if you're using Windows 95, that the *LPT1 Input/Output Range* settings are correct. The correct settings are 0378 - 037A and can be examined and set if necessary by opening the Control Panel, clicking on the System icon, selecting the Device Manager tab, expanding the Ports option, selecting Printer Port (LPT1) and then clicking on the Resources tab in the Printer Port Profiles window.

Games update

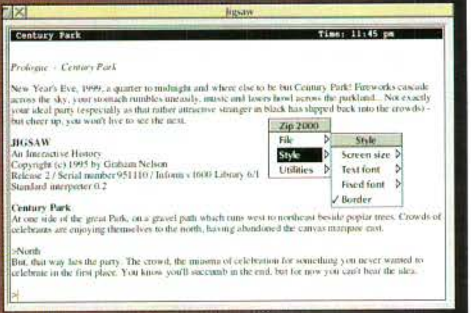
I've managed to test out a couple more games titles since the last issue: Bethesda's *Future Shock* and LucasArt's *The Dig*, *Dark Forces* and *Rebel Assault 2* all run reasonably well on a DX2/80, as do *Doom* and *Hexen* in multiplayer network mode; don't, however, bother with any of the Electronic Art sports games, including *Fifa 96*, *Football Pro 96*, *NHL 96* and *Rugby World Cup*; all of them require VESA drivers. EA's *Extreme Pinball* works, but the bottom of the screen gets corrupted, though this doesn't seriously affect gameplay.

RISC user

Packed with useful applications, the disc costs just £4.75 inc.VAT.
Please add £1 p&p.

Zip 2000

by Kevin Bracey



Century Park — Time: 11:45 pm

Prologue - Century Park

New Year's Eve, 1999, a quarter to midnight and where else to be but Century Park! Fireworks cascade across the sky, your stomach rumbles uneasily, music and lovers howl across the parkland... Not exactly your ideal party (especially as that rather attractive stranger in black has slipped back into the crowds) - but cheer up, you won't live to see the next.

JIGSAW
An Interactive History
Copyright (c) 1995 by Graham Nelson
Release 2 / Serial number 951110 / Inform v1600 Library 6/1
Standard interpreter 0.2

Century Park
At one side of the great Park, on a gravel path which runs west to northeast beside poplar trees. Crowds of celebrants are enjoying themselves to the north, having abandoned the canvas marquee east.

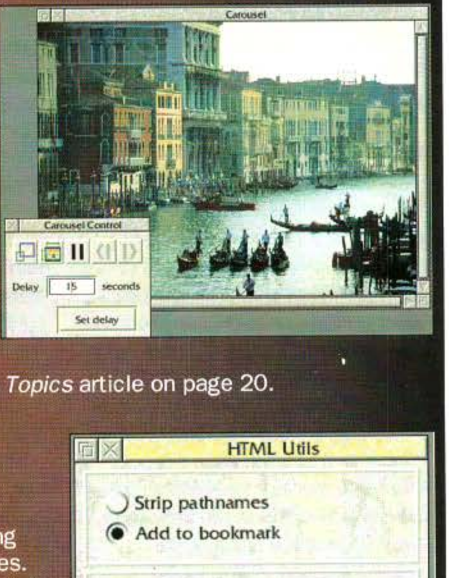
>North
But, that way lies the party. The crowd, the miasma of celebration for something you never wanted to celebrate in the first place. You know you'll succumb in the end, but for now you can't bear the idea.

>

Text adventure games have been overshadowed of late by more graphically-based games, but they have never entirely lost their popularity, and are now making something of a comeback. Among the most popular adventure games of all time are those which were produced by Infocom (see our review on page 27). As a result of a far-sighted decision years ago to write games in platform-independent code, these games can be played on an Acorn by using a Z-code interpreter. *Zip 2000* is a special RISC User edition of a superb RISC OS interpreter that allows you to play Infocom games on your desktop. Elsewhere on the disc you will find sample games to play.

Desktop Carousel

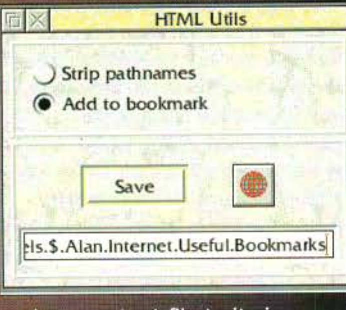
by Alan Wrigley



An updated version of the application first published on the 7:6 disc. *Carousel* enables you to display a sequence of sprites in a window on the desktop. This new version allows you to use squashed sprites with the carousel, as described in this month's *Wimp Topics* article on page 20.

HTMLUtils

by Alan Wrigley



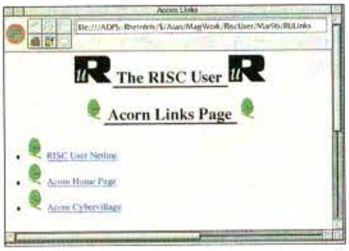
○ Strip pathnames
● Add to bookmark
ls.$.Alan.Internet.Useful.Bookmarks

If you surf the Web a lot, handling URLs can be rather fiddly at times. You often come across references to useful pages in an email or a newsgroup article, but to access the page next time you're on-line means making a note of it and then typing it into the browser's dialogue box when you next log on. *HTMLUtils* allows you to drag any text file to its icon, and it will search for URLs and add them to an HTML bookmark file as links. Just load that file into your browser and click on the link! HTMLUtils will also make it easier for you to download Web pages and view them offline, by stripping pathnames from image tags so that you can access all the pictures from the same directory as the HTML source file.

Adventure Games

To enable you to try out the Zip 2000 interpreter, we have supplied two games on the disc. In *Toyshop* you must find your way around a toyshop crammed with toys and other interesting objects. *Balances* is a magical adventure set in an off-balance world in which you must learn and use spells to progress.

Acorn Links Web Page



The RISC User

Acorn Links Page

- RISC User Netline
- Acorn Home Page
- Acorn Cybervillage

There are now a good many sites on the World Wide Web that are of interest to Acorn users. To help you browse around the Web, we have collected together links to many of them and provided a single Web page containing all these links. The page can be loaded into your browser from your hard disc, and then when you are on-line, clicking on a link will fetch the appropriate page from the Internet.

MAGAZINE DISC

March 1996

Charm Utilities

by Thomas Down

To accompany the review of David Pilling's *Charm* compiler on page 44, the Charm utilities supplied here provide a number of useful library functions that are not included with the compiler, in particular I/O functions and string-to-number converters. If you are using Charm you will find these library routines invaluable.

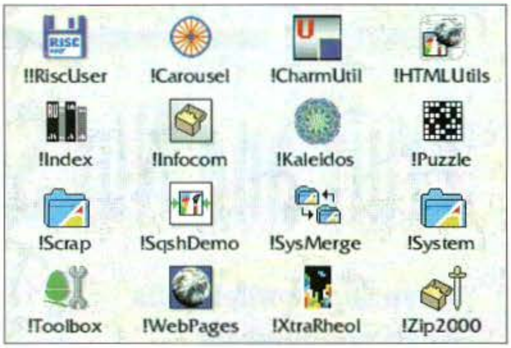
Toolbox

A number of modules from Acorn's Toolbox are required in order to run the *Zip2000* application on this disc. These modules are provided here for this purpose, together with the missing Toolbox modules from the Charm package (See review on page 44).

ArcScan Data

!Index

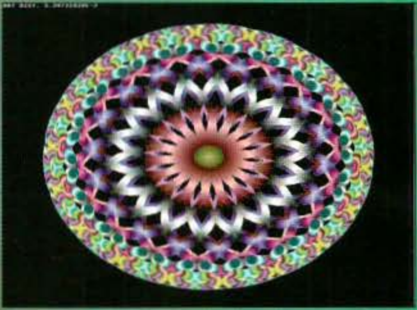
The *ArcScan* index for this month's RISC User.



Kaleidoscope

by Jean van Mourik

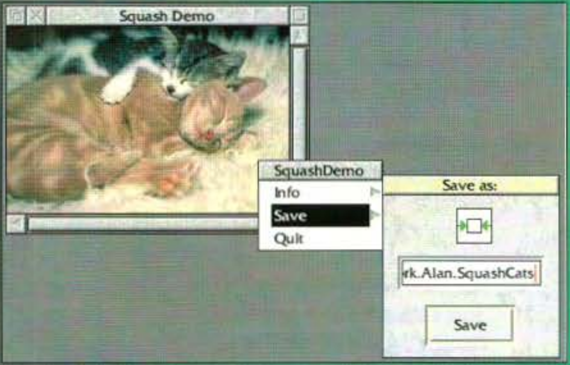
Kaleidoscope creates stunning random symmetrical patterns on the screen, which are constantly changing to produce a colourful and hypnotic effect.



Squash Demo

by Alan Wrigley

This month's *Wimp Topics* article on page 20 describes how to compress and decompress files on the fly using Acorn's Squash module. *Squash Demo* is a small application that demonstrates the principles involved. It allows you to load sprites, either squashed or unsquashed, which are displayed in a window. The sprite can then be saved out as a Squash file.



rk.Alan.SquashCats

Extra Rheolism

by Olly Betts

As described in the *Just A Page* feature on page 49, this is a fully functional Tetris-style game implemented in one line of Basic! You will be absolutely amazed when you play this game, which features coloured pieces, speed control, scoring and the usual keyboard controls!

Fruit and Nut Sensation

Have the death-knells been sounded for RISC OS machines? Richard Hallas ponders the joint Acorn and Apple announcement

Tuesday, 13th February was an eventful day for Acorn. After a sleepless night of negotiations, a deal was finalised at 5:30am and announced in a press conference at a more acceptable hour later that morning: Acorn Education and Apple UK are together to form a joint company to develop Information Technology solutions for UK education. Ownership of the company will be a straight 50-50 split between Acorn and Apple, though the majority of the 39 employees will consist initially of the staff of the former Acorn Education (which will disappear). The new company is as yet unnamed, but is currently going under the singularly unimaginative working title of 'NewCo'.

The alliance is fundamentally between Olivetti Telemedia, 58% shareholder in Acorn Computer Group, and Apple Computer UK, and it concerns Acorn Education only; Applied Risc Technologies, Online Media and Acorn Network Computers are unaffected, as are Acorn Australia and Acorn New Zealand. The company will initially be selling existing machines from both companies; broadly speaking, Acorn machines will be targeted at schools, with Apple machines more focussed on higher education. In the longer term, the company will be looking towards using the PowerPC-based CHRP platform, running Mac OS version 8 ('Copland'). Acorn developers are to be encouraged to rewrite their software for Mac OS. For fuller details of the announcement, please refer to the news pages.

What does it all mean?

This was very late-breaking news, which arrived just as this issue of RISC User was being prepared for the printers. It is therefore far too early to make definitive pronouncements, but it is possible to consider the new development from more than one angle. The most disturbing aspect of the announcement from the point of view of most Acorn users is that it makes the future of RISC OS, and hence Acorn's desktop computers, look uncertain. I am sure that I am not the only Acorn enthusiast who is willing to admit that RISC OS is his overriding reason for being an Acorn enthusiast! The user interface is all-important, and it is the RISC OS desktop that makes Acorn computers so productive and enjoyable to use. Unfortunately, it is the future of RISC OS which now appears questionable. As a company, Acorn cannot really fail to survive in the light of the StrongARM and Oracle developments; but the RISC OS machines are what most Acorn users really care about. So what can we read into the announcement?

The pessimistic view

It appears, on the face of it, as though Acorn Education has effectively been consumed in an Apple venture. If all major Acorn titles are to be rewritten to run on Mac OS, what future can RISC OS have? Apple will win Acorn's education market, and what will Acorn gain in return? Perhaps RISC OS will survive in NetSurfer-style boxes, but it may not appear in the next genearation of desktop computers. Although the new company is owned jointly by Acorn and Apple, it looks as though Acorn has just given away its only significant market to a major competitor. There would be no opportunity for Acorn to start penetrating new markets for its desktop computers and, even if there were, there is no current branch of Acorn which could administer this; a new Acorn 'Business' arm would have to be set up.

The basic problem is not that RISC OS is inferior to Mac OS (it certainly isn't), but that Acorn has no 'industry-standard' applications of significance other than Sibelius, which is only of minority interest. The Mac platform, on the other hand, has some stupendous software, including all the major DTP and graphics packages. Whilst there is also excellent Acorn software in these fields, it is the Mac that is used almost universally by professionals. There is little doubting that Copland will be good, but it will still look like the existing Mac OS and work in the same way; and the RISC OS desktop is fundamentally a much better design. Perhaps Acorn hopes that it will be able to influence the development of Copland to include the best RISC OS features, but I believe that it would be far easier to bolt the nice features of Copland onto a new version of RISC OS than the other way around.

The optimistic view

On the other hand, there are two significant points to note with regard to RISC OS. The press release says that Apple and Olivetti have agreed that Mac OS should be the adopted standard in the new PowerPC machines, but Acorn's position is not mentioned specifically. Also, there is a stated interest in improving the interoperability of RISC OS and Mac OS, which would be rather redundant if RISC OS were to be phased out in a year or so. It would make no sense for Acorn to ask Clan members for suggestions about improving RISC OS (which has recently been done) if it were shortly to be killed off rather than developed further. Perhaps Acorn's plan is to make RISC OS-based CHRP boxes in the future. In my opinion (which I know is shared by many other Acorn users), no other desktop environment comes close to RISC OS in elegance, coherence and effectiveness of design, and it seems almost inconceivable that Acorn would throw it all away in one rash move, especially at a time when new resources for its development have just become available.

As a company, Apple is currently in severe financial difficulties: it will record a loss of $68 million for the current quarter, and is expected to lay off around 1300 staff. However, it has every chance of surviving its current difficulties, and indeed IBM was in a far worse state some years ago, but subsequently bounced back with a vengeance. Of all computer companies (and against all odds), Apple still has the highest brand-profile amongst the UK public (followed by Amstrad); you might expect Microsoft, Intel or IBM to be at the forefront of most people's minds when asked to name a computer company, but a pre-Christmas survey indicated that it was Apple. Acorn has, therefore, acquired a significant ally. The CHRP platform is an Apple and IBM joint project in which Acorn has already expressed a great deal of interest, so there is no conflict there as such, and Acorn is already an equal partner with Apple in ARM Ltd.

A couple of years ago, Apple could easily have swallowed up Acorn. Now, however, Acorn is in a much stronger position as a result of its network computer and set-top box projects. However, the seemingly unstoppable encroachment of Wintel into schools is too much for Acorn Education to fight. In partnership with Apple, though, Acorn will be able to cover every aspect of the educational market and gain extra credibility at the same time. Alongside this, Apple may well have realised that its own forays into the set-top box markets are just not going to succeed in view of Acorn's head start with superior technology; and perhaps they have decided that a strategic partnership with Acorn would be preferable to a futile battle (this is pure speculation on my part!).

Both companies, on their own, are likely to fail in the desktop computer market in the medium to long term; but working together with the same technology, they stand a far better chance of survival. What Acorn enthusiasts have to hope is that RISC OS will be one of the operating systems that users will be able to run on a CHRP machine; after all, a choice of operating systems is one of the fundamental ideas behind the design. If RISC OS were to be supplied as standard as well as Mac OS in all NewCo educational computers, and available as an optional extra, say, to other CHRP machines, then not only would it remain available to all its current enthusiasts, but it would be likely to gain a lot more converts in other market areas. It is also worth mentioning that certain fundamental features of RISC OS (such as image filing systems, for example, which are enormously important though often overlooked) are simply not available on other systems, and so some important RISC OS software could not readily be converted to run under Mac OS in any case. Also, ART is unaffected by the deal, and is free to continue its plans both to develop RISC OS and to support the CHRP platform. These plans are not *necessarily* linked, but it seems highly unlikely that they would be unrelated in reality.

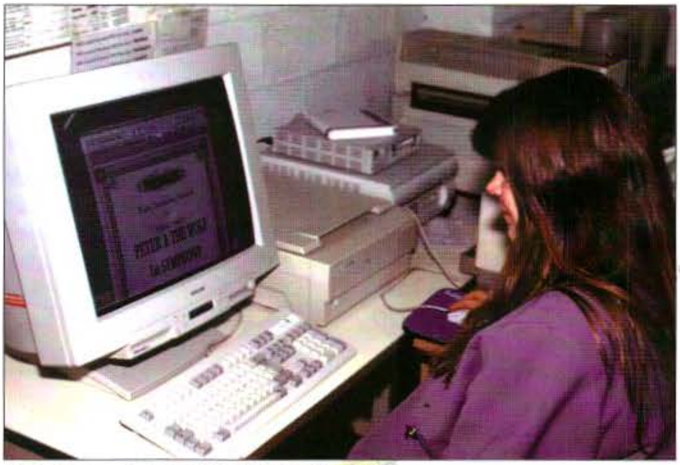
Overall

Well, those are just my initial impressions. Although there is an unspoken threat to RISC OS desktop machines, details on this aspect of the venture are sketchy, and at the very least it looks certain that many major RISC OS applications will survive and prosper. I, for one, though, am more concerned about the operating system than about particular applications. What do you think? Write in and tell us.

Thanks to former RISC User Editor, Mike Williams, for supplying some of the finer details of the announcement

In Business with Acorn

Alan Wrigley visits a printer that does it the Acorn way



Sally Bearpark at work on P&M's Risc PC

Recently I needed some headed paper printed. Having designed it myself using ArtWorks, I thought it best to go to a printer who understands Acorn files, and I was delighted to discover one only a couple of miles away from me in Warrington. I was very pleased with the care and attention I received, and also with the results, so I decided to go back and talk to them about why they chose an Acorn system and how they got on with it.

P & M Printing Services was established in 1983 by Paul Appleton and his wife Michele. The company occupies a unit in one of the many industrial estates dotted around Warrington, and apart from Paul and Michele, who are the partners, it employs three full-time and five part-time staff. As a typical jobbing printer, P & M earns its living largely from bread-and-butter printing work - notepaper, business cards, flyers - the sort of work that small companies need doing day in, day out. However, the purchase of a Risc PC system nearly two years ago has enabled the company to focus more on design work than it was able to do previously.

The decision to computerise was taken because customers' requirements were getting more complex, and it was starting to take an unacceptably long time to process anything but the simplest of jobs. Everything had to be done manually by pasting the layout together on a board, and things such as tints or different typefaces stretched their manual system to the limits.

Various systems were considered, but the decision was finally made at the Northprint Exhibition in 1994. A demo of a PC system was unconvincing, as was a similar demo of an Apple Mac ("It'll do what you want in a minute, honest"). The Acorn system being demonstrated by A B Dick won hands down for its speed and apparent user-friendliness, and P & M acquired a Risc PC plus a 21" monitor. An Epson GT8000 scanner, a QMS A3 PostScript printer and a 44Mb SyQuest were added, and the machine was soon upgraded to 42Mb of RAM as the original specification proved insufficient.

Graphic artist Sally Bearpark was immediately impressed with the system. Although her background had been in design, her experience of computers was limited, but she was soon won over by the gentleness of the learning curve and the logical way in which everything works on the RISC OS desktop. "I could see how to do most things straight away," she says. It didn't take her long to develop a high level of expertise with both Publisher Plus and ArtWorks, which are the two packages most widely used (Photodesk was also in evidence but is only used at present for retouching photographic images). On the day I visited P & M, Sally was hard at work finalising a client's design in Publisher, while carrying her seven months of pregnancy with a smile!

Surprisingly, the vast majority of customers still do not supply work on disc. Most provide a mock-up or an idea on paper, and Sally or her colleague Angela translate the design into electronic form using Publisher or ArtWorks. This means that for the moment transfer of files between platforms on the inward side is not a big issue. However, like many people, they have had problems in getting Macs in typesetting bureaux to handle PostScript files correctly. This was solved eventually when it was discovered that the Acorn PostScript driver was getting one character wrong in the file, but PostScript problems are not confined to Acorns. In my experience, similar problems can arise even when there is a Mac at both ends of the chain running the same software.

At present the computer is seen purely as a design tool, and no effort has been made to use it for administrative tasks. In the future the company may invest in a PC and/or a Mac, perhaps to run office systems, and also to be able to offer full compatibility to Quark and Illustrator users. They have recently had a PC card fitted to the Risc PC, although as yet they haven't made much use of it, and curiously their system seems to crash occasionally since it was fitted. I have of course suggested that they wait until Acorn release their CHRP computer before deciding to invest in other hardware - if Acorn get it right this could enable them to run PC, Mac and Acorn software all on the same system. I've also told them to keep an eye open for Ovation Pro!

Overall, the company is very pleased with its choice of computer system. They have come a long way in the last couple of years, and are now producing work of a much higher standard. Speed is a significant factor too: a job which previously took two to three days to complete can now be turned around in a day. The design staff like the system. As I said earlier, Sally, with limited computer experience, found it very easy to learn; while Angela, who had used Macs before, has now got used to RISC OS and likes the feel of it, though she still prefers Quark to Publisher. Both of them felt, however, that there is one feature which lets the Acorn system down very seriously, namely the lack of support for Pantone colours. In the world of printing and publishing, Pantone is a genuine industry standard, and it's hard to see how Acorn software will be taken seriously without it.

It's good to see a small company choosing a computer system on the basis of what is right for them, rather than blindly following the herd. If more people did this then I'm sure there would be many more Acorn systems used in business - after all, *we* all know how good they are!

P & M Printing Services can be contacted at:
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Flexible from Start to Finish

Richard Hallas takes a look at release version 3 of Sibelius

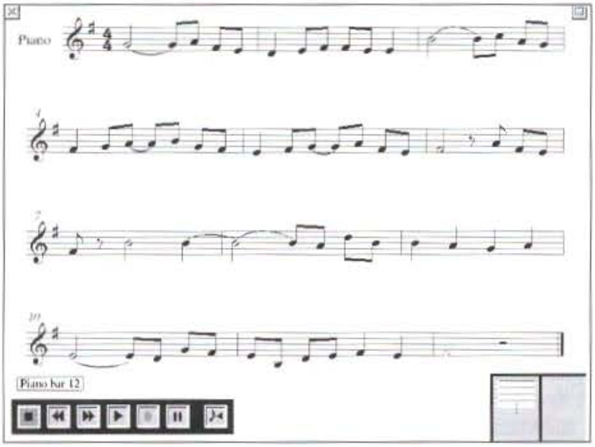
In terms of software selling computers, Sibelius is undoubtedly the most successful package ever to appear for RISC OS. No other package has managed to cause Acorn systems to be bought by a previously untapped public in the way that Sibelius has done. Intended primarily as a music typesetting package of enormous speed and flexibility, Sibelius evolved to become also a formidable means of playing the music on the screen. Indeed, its playback facilities are so impressive that it was able to give the premiere performance of two Piano pieces by the Hungarian composer Ligeti in a performance at the Royal Academy of Music a year ago; the pieces were too difficult for a human to play!

Now version three has appeared, complete with some enviable new features which present major leaps forward, and this review takes a look at how well they work. The most significant of the new features are concerned with music input rather than additional typesetting facilities: MIDI file handling and intelligent real-time MIDI input.

Your flexible friend

Previous versions of Sibelius allowed you to use a MIDI keyboard to input music note by note in step-time; now 'super-intelligent' (according to the advertising) *Flexi-time* real-time input is included so that you can play in the rhythm as well.

So what's so special? There are two basic features that elevate it above rival programs: the music is notated in real time as you play it in, and Sibelius understands the basic human inability to time all note values in centi-seconds! Hence you can be reasonably imprecise about your playing, without Sibelius producing lots of idiotic tied hemidemisemiquavers all over the place, as found so often with real-time input on other systems. Also, its 'insight' allows you to gradually speed up or slow down the overall tempo of your input, and the metronome will adjust its speed to follow you!



Untouched by human hand: the notation on the screen is exactly as laid out by Sibelius during input via MIDI keyboard

I tried playing in various passages of greater or lesser complexity, and it made a commendable job of understanding me. I also found that I could alter my overall tempo very significantly indeed (more than doubling and halving it, for instance) and Sibelius would keep time with me, provided that I was subtle enough about each change. Indeed, you can alter the beat subdivisions to make it more or less prone to using short notes, and there are three settings of 'rubato' to indicate how rhythmically loose you expect your playing to be.

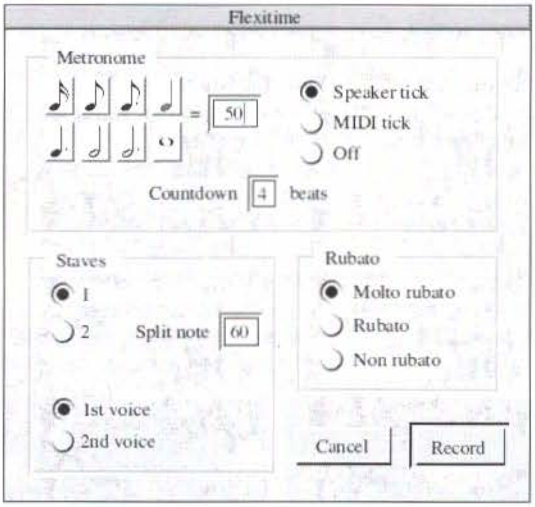
You can play whole chords, and Sibelius will tie sustained notes together automatically. In fact, you can play onto two staves at once, with notes below a definable pitch going onto the second stave. It's all pretty impressive, therefore, and if you use a keyboard to input music regularly, the version 3 upgrade has to be worth the money for this feature alone.

It does have a few limitations, of course; for one thing, it seems incapable of understanding tuplets, so even basic triplets are out. Also, it will not read the time signature and make an intelligent adjustment; so if you are in compound time (such as 6/8) you have to tell it to use a dotted crotchet as the basic beat, or else it will notate in simple time.

It is quite easy to overestimate Flexi-time's capabilities, having been very impressed by simple examples! I found that playing in some moderately complex piano music on two staves all at once resulted in a complete mess. If you stick to one stave at a time, or simple two-stave things, though, the results are excellent. A sensible approach from the user yields good results, and altogether this is an excellent time-saver.

MIDI file support

Another major new feature is MIDI file support. Sibelius will now import and export MIDI files (though Sibelius 6 will not export), and the import facilities claim to do a good job of sorting them out and turning them into decent notation. In fact, MIDI import is based heavily on the Flexi-time routines: the imported music is subjected to intelligent interpretation in the same way as music that you play in on a keyboard, and you can control the quantization parameters, in terms of basic note-values and so on, in a similar way to the keyboard input method.


Flexitime

Metronome

= 50

● Speaker tick
○ MIDI tick
○ Off

Countdown 4 beats

Staves
● 1
○ 2
Split note 60

● 1st voice
○ 2nd voice

Rubato
● Molto rubato
○ Rubato
○ Non rubato

The flexitime options for MIDI keyboard input

Importing files is by no means an instantaneous operation (which seems uncharacteristic given the remarkable speed of all other parts of Sibelius), but it's still pretty fast. A few seconds seems fairly average, though long and complex files may take a few minutes to process.

Text (such as titles and vocal underlay) is placed appropriately on the page, and Sibelius tries to be as sensible as possible regarding instruments: for instance, a Piano track in a MIDI file will be given a pair of Piano staves on the page, and all other General MIDI instruments will be given their appropriate names and characteristics. For MIDI files which do not use General MIDI, a mapping facility is under development. Indeed, some extra new MIDI import features are currently being implemented and will be included in a free upgrade.

Other goodies

Those two features are the most important new ones, but there are lots of more minor improvements too numerous to list here. For instance, playback is better specified: the program now understands Piano pedalling, string articulation marks and so on, and Sibelius 7 has Swing settings for jazzy playback!

Certain notational details have been improved; for instance, beam grouping is now automatic (it seems to miss some of the more subtle rules, though these can be adjusted by hand if you know the rules yourself!). At long last, you can add a tie or slur simply by pressing a key (though it may need editing slightly). There's a composers' notepad (basically a spare non-printing page) for cut and paste purposes, and there's also now two-up printing with a pamphlet mode.

Sibelius

Supplier	Sibelius Software 75 Burleigh Street Cambridge CB1 1DJ Tel. 01223 302765 Fax 01223 351947
Email	info@sibelius.demon.co.uk
Prices	Sibelius 6: £179 ex. VAT; upgrade £49 ex. VAT Sibelius 7 Student: £495 ex. VAT; upgrade £99 ex. VAT Sibelius 7: £888 ex. VAT; upgrade £149 ex. VAT

As far as I'm concerned, though, the most important 'small' change is that you can, finally, add your own text styles to the list. I have always found Sibelius' text styles to be unreasonably limiting in the past, but now those limitations have been removed altogether. I'm also pleased to find that alignment facilities have been extended by the addition of a page grid and cross-hairs, and better WYSIWYG editing.

Conclusions

Sibelius is undoubtedly a brilliant tool for composers and inexperienced computer users. As a music typesetter myself, I have to say that there are many complex typesetting problems that it will not as yet address, or which it can achieve only with great difficulty; and I find the single-bar-only copying facilities extremely rudimentary. Nevertheless, for the vast majority of users it is a wonderful tool, and it is certainly a very well-rounded program. I hope that the next version will introduce some more flexible editing options and finer typesetting controls in some areas. Overall, though, I have no reservations whatsoever about saying that version 3 is a significant advance which makes Sibelius an even more resoundingly excellent product than it was already.

QuickTime VR Viewer

Richard Hallas steps into a virtual world

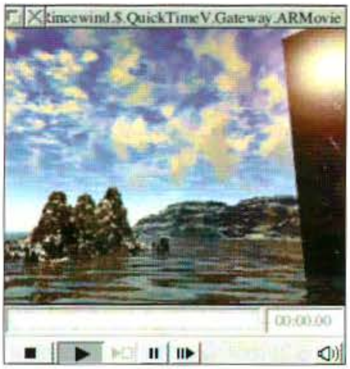
Warm Silence Software, a company which seems to be coming up with numerous small but interesting utilities, has now produced a viewer application for Apple's QuickTime Virtual Reality files. Like the same company's *MovieFS*, which makes many foreign-format video files work transparently with Acorn's Replay system (see review in RISC User 8:7, page 43), the QuickTime VR Viewer is an application which can be forgotten about once you have dropped it into your boot sequence. Indeed, though the QuickTime VR viewer can be used on its own as an extension to Acorn's Replay, it integrates with the rest of MovieFS if you have that software already installed.

What's QuickTime VR?

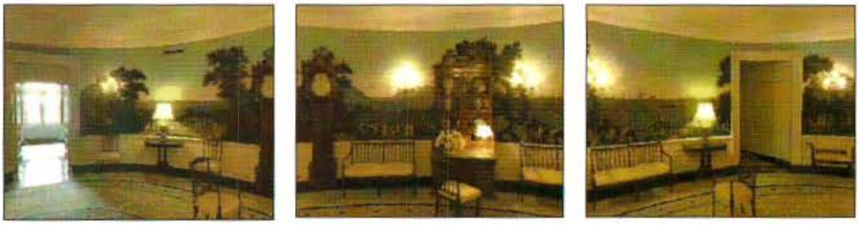
One of Apple's latest innovations is a virtual reality system which forms a part of their QuickTime software. Virtual Reality is, of course, an attempt to create on a computer system a believable environment in which the user can look around, move around and interact with objects in the virtual world. It's something which the average man in the street associates with people wearing silly-looking head-sets and gloves. Apple's QuickTime VR (QTVR) doesn't go quite as far as that, but it makes a good effort at presenting a convincing three-dimensional space on a standard computer screen without resorting to head-sets and a monitor for each eye! You can look around and move between locations within scenes, and you can manipulate objects by turning and tilting them.

The way it all works is actually quite simple. In order to create a scene, a photographer goes to a location and take lots of photographs whilst turning the camera on the spot, so that every angle is covered; each new photograph overlaps with the previous one so that putting them all side by side produces a 360 degree view. The resulting photographs are scanned in and fed into the computer (note that you cannot make QTVR files on an Acorn; only a Macintosh has the appropriate software at present) and what you end up with is a 'node': a single image file which contains a panoramic view from one particular spot. Of course, photographs aren't vital to the process; with suitable software, nodes can be made from entirely computer-generated images.

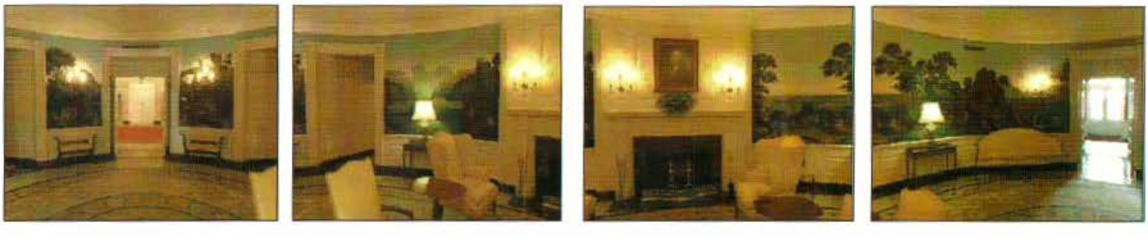
A basic QTVR scene can consist of just one node, but it is much more



The QuickTime VR Viewer works through Acorn's ARPlayer



Turning around in a full circle to view the entire elliptical Reception Room in the White House. Note how the pictures all overlap with one another; in reality, the motion is very smooth.



interesting if there are several. Typically, a scene will consist of several nodes which are within sight of one another, so you can effectively 'walk about' by moving from one node to another, and seeing where you've just come from. Objects are basically similar to scenes in that they are comprised of several photographs taken from slightly different angles: as you turn and tilt the objects, the software displays the appropriate images.

Square eyes

On the Macintosh, a special player application exists for exploring QTVR scenes. With the Warm Silence player, though, viewing is normally done through Acorn's *ARPlayer* just as with other Replay movies. As soon as you load a scene and click on the Play button, the pointer turns into a circle to focus on the area of interest (though this can be turned off if you find it distracting), and as you move the mouse left and right, the scene spins before your eyes just as if you were standing there and turning. Moving the pointer up and down looks upwards and downwards (to the edge of the picture, which is cylindrical, not spherical) as if you were raising and lowering your head. Pointing at an area of the picture which leads to a new node results in a little red arrow appearing within the pointer, and a double-click moves to the new part of the overall scene.

Holding down Select and moving the mouse backwards and forwards moves into and out of the picture. This is where the concept of the software lets itself down, I feel. It has to be borne in mind that all that's really happening is some fairly sophisticated manipulation of a single bitmap image. The edges of the visible picture are distorted as the view changes so that it always appears to be in correct perspective regardless of which direction you're looking in; and in fact the turning and looking around is actually quite convincing. However, the zooming in and out is much less effective. After all, there's only a finite amount of detail in the bitmap, and as you zoom closer, the pixels get larger and more obvious. If a large enough bitmap could be stored so that the detail could increase significantly as you went into the scene, the effect would no doubt be much more convincing; but as it is, parts of the picture increase in size without increasing in detail, and so the realism is rather compromised. The Apple software smoothes the picture whenever you stop moving to reduce the effects of pixellation, which helps to a limited extent (though the overall effect is of the picture going out of focus as you zoom in). The Warm Silence viewer does not yet do this, but will in the next release.

Overall, I found the control method of the Warm Silence viewer much more natural and fluid than the Apple implementation. The Apple system requires use of both mouse and keyboard to explore scenes, and the picture will be in constant motion unless you park the pointer in a specific place. Also, there is a multitude of confusing pointer shapes which tend to get in the way. By contrast, the Warm Silence software can be controlled entirely by the mouse, requires only two pointer symbols (or just one if you turn the 'normal' pointer off), and moves the picture only when you move the mouse, which feels much more natural than the Apple version. Full marks for the user interface, therefore.

Performance

I am pleased to say that the Warm Silence viewer's performance is really surprisingly good. I tried the Apple software on a 75MHz PowerPC 603-equipped Mac, and found that it was actually slightly jerkier than on my 30MHz ARM610-equipped Risc PC, which seemed very smooth by comparison. As far as I know, the Apple software has been optimised for the PowerPC; given that the Warm Silence viewer is written in plain old C, with no specific optimisation for the ARM processor, this says quite a lot about both computer systems.

The only thing that lets the Warm Silence software down at the moment is its colour rendering, which is noticeably darker than on the Apple version; scenes generally look under-exposed. I am assured that this is only temporary, though, and will be improved in the near future. Indeed, it is fair to say that the software I received was pre-release; full compatibility with all QTVR files currently requires a Risc PC, but the software will soon work in its entirety on older machines. Despite not being the final version, though, it worked extremely well.

QuickTime VR Viewer

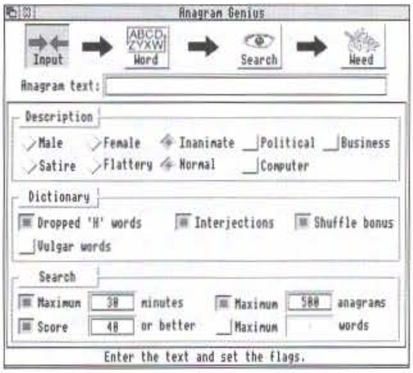
Supplier	Warm Silence Software St Catherine's College Oxford OX1 3UJ Tel: 0585 487642
Email:	Robin.Watts@comlab.ox.ac.uk
Price	£20 all inclusive (introductory offer only)

Whilst QTVR scenes may be considered rather specialised at the moment, it seems likely that they will become popular. They are already being used on CD-ROM titles, for instance, and the system was even used (in the US - where else?) to show TV viewers a walk-through of the crime scene during the O. J. Simpson trial! It is pleasing that a viewer has become available for Acorn machines so quickly, for once; and at the asking price it's a good buy if you think you might need it. Note that the price is likely to rise when the software is finished, but if you buy now, upgrades will be free.

An Amusing Rage

by Roger King (a managing user) reviews Anagram Genius

Anagram Genius is an anagram-generating application published by The Fourth Dimension. A very similar earlier version, *SuperGram*, has been available directly from the author, William Tunstall-Pedoe, for quite some time. The original application has even been demonstrated on television. The program installs on the icon bar in the usual way, and clicking Select on the icon brings up the main Anagram Genius window (see figure 1) with four large icons at the top: Input, Word, Search and Weed.



Anagram text:

○ Male ○ Female ● Inanimate ☐ Political ☐ Business
○ Satire ○ Flattery ● Normal ☐ Computer

☑ Dropped 'H' words ☑ Interjections ☑ Shuffle bonus
☐ Vulgar words

☑ Maximum 30 minutes ☑ Maximum 500 anagrams
☑ Score 40 or better ☐ Maximum words

Enter the text and set the flags.

A geranium sang (in Berkeley Square?)

Sugar, an enigma

To begin, click on Input and type in a string. You may enter spaces and punctuation, but it will be ignored when producing anagrams. You can set various switches which will influence the program's choices of words, and there are further options to control the kinds of words suggested by the dictionary and also the search time limits.

There are two search options: if you click on the Word icon, then the application will produce a list of single words found in the input string; and if you click upon the Search icon, the application will produce multi-word anagrams of the entire input string. These multiple words are flagged with a percentage mark to rate how good they are.

A Sumerian gang

When searching is finished, you may choose the Weed icon, which opens a window showing all the multi-word anagrams found. If you now double-click on an anagram in the list, a further window will open which allows you to edit the word order of the chosen anagram and to add punctuation if needed. Clicking on OK stores the rearranged anagram in a small panel within the main Weed panel.

Anagram Genius has options for saving text, in the form of reports, sub-words and raw anagrams. The Report option lists some of the longest anagrams of the input string, not necessarily using all of the letters; the Sub-words option produces a list of single words that have been found in the input string; whilst saving Raw Anagrams produces a list of all the multi-word anagrams.

Arguing seaman

For the purpose of this review, I used the names of two members of Channel 4's *Countdown* show. This very popular programme features contestants trying to make the longest anagram of a nine-letter string, together with a numbers game. One of the anagrams of Richard Whiteley, the presenter of the show, is *Hairy, idle wretch*, whilst an anagram of Carol Vorderman, another presenter, is *Clad Roman Rover*. Anagram Genius certainly produces better anagrams if the input string is of a good length; short input strings usually fail to produce interesting anagrams.

One potential problem with Anagram Genius is that if the Satire and Vulgar options are set, the program may well issue anagrams which include rude words. This might not be desirable if children are to use the application, so an additional *Features* utility is provided which allows these options to be disabled, removing them entirely from the Anagram Genius window. Make sure that the Features application is hidden away, though, as the children might find it and re-install the naughty words options!

Anagram Genius

Supplier	The Fourth Dimension 1 Percy Street Sheffield S3 8AU Tel. 0114 276 9950 Fax 0114 278 1091
Price	£19.99 inclusive Book

A book entitled Anagram Genius, containing numerous anagrams produced using this program, is also available from Hodder and Stoughton at a price of £4.99

Runs game again

Anagram Genius is an excellent program for the asking price, and should be invaluable to anyone interested in producing anagrams for word games or crossword puzzles. I was a little disappointed with the program's presentation: the layout is extremely sloppy, particularly in a high resolution screen mode; and the single non-resizable window which is used to contain all the information could have been better thought out. These are minor points, however, and in terms of the output it produces, and the speed at which it works, the program is very impressive. Highly recommended.

No prizes for guessing how we got the title and subheadings for this article!

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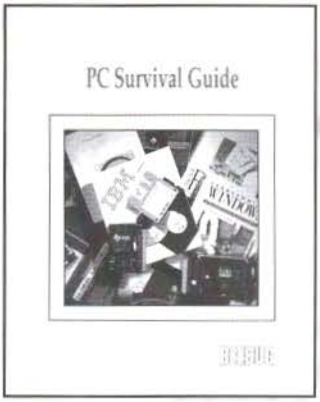

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Charm School

Thomas Down reviews a new high-level language compiler at a very competitive price

Despite the undeniable power of BBC Basic, sooner or later many programmers decide to learn a compiled high-level language. Compilers can produce much faster code, and are usually considered more suitable than Basic for the development of large applications. Although several such languages are available on other systems, the main choice, at least until now, for Acorn users has been the ever-popular C, or, more recently, C++. But now an alternative system is available from David Pilling at a very competitive price. *Charm* has actually been available on Acorn systems for several years now, but it has just been re-released with a number of major improvements, including support for Acorn's Toolbox modules.

As a language, Charm is perhaps most similar to Pascal, although it also borrows features from several other languages, as well as introducing a few new ideas of its own. Like C, it is always supplied with a standard library, which is required for any interaction with the user. A simple program could be written as:

```
module example;

include "io"    | Read I/O definitions |

ent proc start();
  int i;

  for i:=0 step inc(i) while i<=10 do
    write_string("Testing: ");
    write_integer(i);
    write_newline();
  end_for;
end_proc;         | start |

end_module;
```

The form of the `for` statement, starting with an initialisation statement, followed by a `step` operator, then finally a condition, will be familiar to C programmers, although Charm uses a rather more verbose syntax. This last comment applies to most Charm statements, and although Charm's syntax may not always appeal to very experienced programmers, it is more reader-friendly than most C code.

Installation

Charm is supplied in a rather smart plastic folder and, unlike the earlier release, includes a printed manual. The software itself comes on two discs, one containing the compiler, linker, assembler, and associated files, and the other the Toolbox and a set of example programs. Unusually for a compiler, the Charm system can be run from floppy discs, even on a 1Mb machine. If you are using it in this way, you need only make a backup of disc 1 to use as a working copy, and you are ready to start. Hard disc installation is a little more complex, and will involve editing at least one Obey file. Fortunately, the process is documented reasonably well in the manual, although a more automated installation would be useful.

Once installed, running the *!Charm* application displays some status messages, then places an icon on the icon bar. Charm source modules can be compiled by simply dragging them onto this icon, but to link them it is necessary to create a simple Obey file and drag this to the icon bar. While this approach has its merits, I would have preferred to see a 'beginners' mode, where dragging a source file to the icon carries out both the compile and link stages automatically.

Dragging a file to the Charm icon while holding down Shift loads the file into Charm's own editor. This is quite powerful, and has a number of features designed specifically for editing Charm code. However, it is not particularly user-friendly, and doesn't run in the desktop. I preferred to use a desktop text editor instead. The only problem with this was that Charm's error throwback system, which locates the line in a source module where a compiler error occurred, only seemed to work correctly with its own editor.

In use

Since Charm is not a 'standard' language in the same way as C and Pascal, new users of the package will be relying almost entirely on the manual to learn it. Unfortunately, the introductory section, whilst making an admirable attempt to explain what compilers and assemblers actually *do*, does not provide a particularly enticing start for novice programmers. After explaining how to use the compiler and linker, the manual begins an explanation of the Charm commands. Although this is quite well written, I feel that a tutorial-style guide would be more appropriate. A brief tutorial is included on disc, but I didn't think this was pitched at the right level either; especially when, near the start, it recommends changing screen mode by writing control characters to the VDU drivers, totally ignoring a simple function in the standard library which could do the same job.

The language certainly has a few peculiarities. The most noticeable quirk I came across was the insistence that all floating-point constants should be given in standard form, so the code

```
real a,b;
| ... |
a:=b*32.65;
```

will fail. Instead, the constant must be expressed as `3.265e1`. Admittedly, all the examples given in the manual are correct, but this 'feature' is never mentioned explicitly. The compiler also has a habit of objecting to brackets when they are not necessary, so Charm will reject the following code:

```
if (a=2) and (b=4) then |...|
```

Being used to C, which uses more brackets than Charm and is generally happy to ignore any unnecessary ones, I found this rather irritating.

What really lets Charm down, however, are its libraries. Like C, Charm is a library-based language, with many important features, including I/O support and mathematical functions such as square root and sine, being implemented in linkable libraries rather than directly by the compiler. While I have no objections to this approach, it does make design and implementation of the library absolutely crucial, and I feel that this aspect of the Charm system has not yet had enough effort devoted to it. Some simple operations, like reading a number from the keyboard, are not supported at all. It is rather off-putting to find that what was a simple one-line operation in Basic now requires a large amount of code to implement. My attempt at implementing a few essential functions, such as a routine to read a string INPUT-style from the keyboard, is included on the magazine disc.

Unlike the C standard library, the Charm library is machine-specific, and includes a number of useful functions for tasks such as simple graphics. Unfortunately, only an equivalent of Basic's `PLOT` is implemented; there are no simple functions for `MOVE` or `DRAW`.

The latest version of Charm provides two approaches to windowed programming. The first is a simple set of functions which allow access to the Wimp SWI calls. These are only really usable if you have access to the programmer's reference manuals; as with most of the library functions, the documentation for these calls is extremely sparse. An example application is included, but it has only minimal comments to assist anyone who is trying to follow it.

The second, and rather more exciting, system for writing a windowed program is provided by Acorn's Toolbox. This was originally released with the Acorn C/C++ package, but was always designed to be language-independent. The latest version of Charm is advertised as supporting the Toolbox, and indeed the Toolbox modules are supplied together with the *!ResEd* application used to design the user interface of Toolbox programs. Unfortunately, one major problem is immediately apparent: several important support modules used by the Toolbox are not included, so unless you use RISC OS 3.6, or have already installed the Toolbox in your System folder from a different source, you will not even be able to run the supplied example.

Product: Charm

Supplier	David Pilling PO Box 22 Thornton Cleveleys Blackpool FY5 1LR
Email	david@pilling.demon.co.uk
Price	£25 inclusive

Charm's support for the Toolbox takes the form of a library of SWI veneers almost identical to that which Acorn supplies with C/C++. Unfortunately, there is no real documentation for this at all, either in the example program or in the huge definitions file which accompanies the library. Anyone planning to use the Toolbox from Charm will almost certainly need the original Toolbox manual from the C/C++ package. This can be bought separately, but it costs £47 - almost twice as much as the compiler itself!

Conclusions

When I first saw this package, I thought it had great potential as an entry-level compiled language for programmers who wished to move up from Basic, and also as a teaching language for schools and colleges. Having used it for some time, I still feel it has the potential to be very useful in both these fields. Unfortunately, a generally good language definition and compiler are badly let down by the rather patchy libraries and the poor documentation that accompanies them. These problems are certainly not insurmountable, and I hope that an updated version will appear soon with improved libraries, and perhaps a new tutorial. Until then, however, I would find it hard to recommend this package to either of those sectors.

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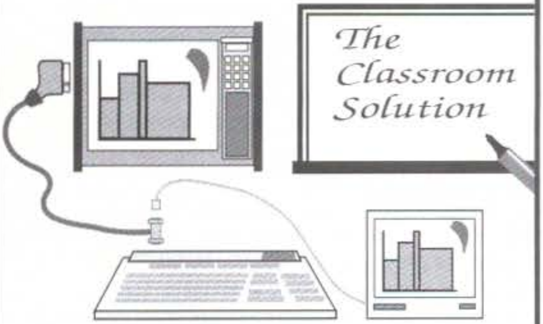

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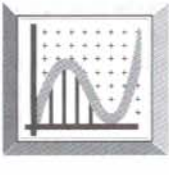


HINTS & TIPS

Keep sending us your hints and tips. Published submissions will receive a free RISC User disc of their choice

Using Print Speed under new versions of Printers

Matt Browne

For machines with no more than 4Mb of RAM, free memory can become very tight when printing using new versions of *Printers* (notably version 1.52). This can sometimes cause *Print Speed* (from the RISC User issue 9:1 disc) to run out of free memory and cause an error message saying: *Due to an unknown error, probably with the Printer Manager, printing could not take place. All recent printing has been lost. Please try again.* This is, in fact, due to a lack of memory and not usually anything else! Rebooting your machine or fiddling with the task manager can often solve the problem.

Non-Latin1 alphabets for outline fonts

Charles Bailey

Although RISC OS is only designed to use the Latin1 components of font definitions, it is possible to trick it into using an alternative alphabet definition instead by forcing a different encodings file to be loaded instead of the standard Latin1 file. This allows you to use a Latin2 alphabet, say, for all work (including printing) done on your computer, providing that your fonts contain the appropriate character definitions, of course (all the ROM fonts supplied with RISC OS do).

First, choose *Open '$'* from the menu of the icon bar's *Apps* icon, and double-click on *Fonts* in the newly-opened *Resources:$* directory. Next, find your *!Fonts* directory and double-click on it with <Shift> held down to open it up. Drag the *Encodings* directory from the *Resources:$.Fonts* window into *!Fonts*. Now double-click on the new copy of *Encodings*, and in the window which appears, rename the file *Latin1* to *Latin1X*. Then choose which alphabet you want to use instead, and use the filer's *File>Copy* menu to make a copy of the appropriate *Latin#* file as *Latin1*. If you want to use a Latin2 alphabet, therefore, you would copy *Latin2* as *Latin1*.

Finally, insert the following two commands into your boot sequence, to be executed before the desktop starts up (e.g. in the *!Boot.Choices.Boot.PreDesktop* file on a Risc PC):

```
    SetMacro Font$Path
      ADFS::4.$.!Boot.Resources.!Fonts.,
<Font$Prefix>.,Resources:$.Fonts.
    Alphabet Latin#
```

where the # in `Latin#` is the alphabet you have chosen (e.g. *Latin2*). The *Alphabet* command affects the system font only. Note that you may have to alter the first line above to point to your *!Fonts* folder; the example is appropriate for a Risc PC.

It is important that the lines above are in an *Obey* file rather than a *Desktop* file, because they need to be executed before the desktop is entered, and a file of type *Desktop* starts the desktop up before it is executed. If you only have a !Boot file with the type *Desktop* (which is likely on a pre-Risc PC machine), then you will have to rename it as *!Boot2* and save a new *Obey* file called *!Boot*, containing the above two lines plus the following:

```
    Desktop -file ADFS::4.$.!Boot2
```

Now, every time you start up, you will be using the alternative Latin alphabet of your choice. The first sign of the change will be that the copyright symbol in the RISC OS start-up banner has changed to an accented character. If you wish to revert to Latin1, just copy your renamed *Latin1X* file as *Latin1*, and amend the *Alphabet* line in your *!Boot* file.

Custom alphabets

Charles Bailey

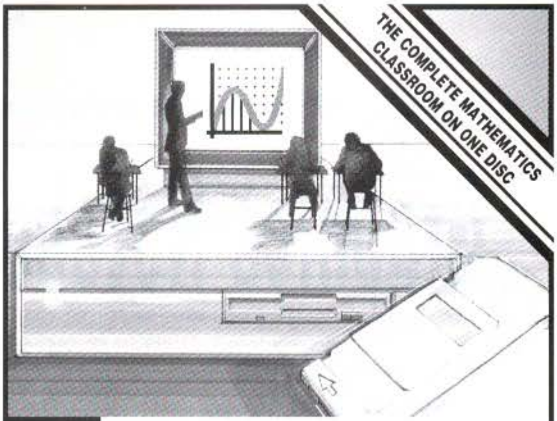
It is possible, in conjunction with the previous hint, to create your own alphabet by editing the *Latin1* encodings file by hand. It contains, in order, the 256 character names that you wish to use. It is only advisable to edit the latter 128 definitions; otherwise you may end up rendering normal text unreadable! However, if you wish to use, say, an accented character regularly which is only available in Latin2, and there is a character in Latin1 which you never find useful, you could just replace one with the other to produce an alphabet which is much more useful for your own purposes. If you do this, though, it would be advisable to use a character definer program to produce a new system font definition which reflects your changed outline font layout.

Problems with the DrawFile module

Aaron Timbrell

Acorn's *DrawFile* module provides a nice, easy-to-use interface for the rendering of Draw files. Beware, however! If part of your Draw file extends below the origin (the bottom left corner in a Draw window) so that it has negative coordinates (-x, -y), the DrawFile module seems to calculate the bounding-box wrongly.

Please send in your hints and tips on any aspect of using Acorn's RISC OS machines and Pocket Books. Published submissions will receive the magazine disc of their choice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Graphics Notebook

This new column provides hints and tips for users of all painting and photo-retouching packages

Unrecognised sprites

Lee Calcraft

When you create a new canvas in Photodesk (by clicking on the icon bar icon), the dialogue box not only lets you determine the canvas size in inches, but also the *dpi* (the number of dots per inch). This works very well, and allows you, for example, to tie in your canvas size with the type of final printout that you are looking for - it might be 10 x 8 inches at 200dpi.

The only snag with this is that if you alter the resolution from the default of 90dpi, the sprites created by the package are unreadable by most other graphics packages (though of course Photodesk is entirely happy with them). Paint gives the error: *This sprite is stored in an unrecognised screen mode.* Both Pro Artisan and Revelation report that the dpi is unacceptable and reject the sprite. ChangeFSI accepts the sprite, but gets its size wrong, treating it as if it were 90dpi.

ImageMaster adopts an interesting approach. It loads the sprite without complaint, and when you save it out, it retains the correct size, but alters the recorded dpi to 90. This 'normalises' the sprite so that it can be loaded into other packages such as Paint and ProArt24.

Mysteries of JPEG output in ChangeFSI

Richard Hallas

The latest version of ChangeFSI (version 1.13s), which is available on Acorn's FTP site, sports a *JPEG Output* option on its menu. This output mode has caused a significant amount of confusion, as the result of turning it on and converting an image is an apparently empty window on all but the newest machines.

The reason for this is that ChangeFSI is attempting to make use of the fast JPEG display code provided by the *Sprite Extend* module which is built into RISC OS 3.6. Since this code is only present in A7000s and new Risc PCs, the image cannot be displayed on earlier, pre-RISC OS 3.6 machines. The important point to grasp is that JPEG is now a RISC OS-native image format, just like sprite format, and ChangeFSI is not attempting to convert from JPEG to sprite for the purposes of its display.

Therefore, the option is actually working correctly, and you can use it to convert files into JPEGs even though you can't see the result immediately. To verify that it does work, make a JPEG with ChangeFSI, save it out, switch back to *Sprite Output* on the ChangeFSI menu, and load the JPEG back in again. You will see it in the window, meaning that it has been translated into a JPEG correctly first of all, and then into a sprite for display purposes.

Image degradation

Lee Calcraft

Photodesk works in 32-bit colour. If an image which you are editing in Photodesk is to be used at a different colour depth - say 16-bit, but more particularly 8-bit - there can be a degradation in quality as you move repeatedly between the two sprite modes. This can be avoided by using ChangeFSI to perform the conversions in both directions, with dithering switched off. So when you save from Photodesk, save as a 32-bit sprite, and convert to the chosen sprite mode in ChangeFSI; and when loading a low resolution sprite, use ChangeFSI to convert it to 32-bit, and drop this into Photodesk.

Cropping images in Paint

Richard Hallas

Paint is actually a very handy tool for cropping images, such as trimming the edges off a scanned picture. Pop up a menu over an open sprite window and move the pointer right over the *Edit* option to reveal a submenu with *Delete columns* and *Delete rows* items. You can enter numbers into the associated entry boxes to delete a specific number of columns or rows: columns are counted from left to right, but note that rows are counted from bottom to top.

What is less well known is that you can, instead, simply move the pointer over the image to select the number of columns or rows to delete. In other words, click Menu over the first row or column that you want to be trimmed off, move through the menu so that the *Delete columns/rows* entry box is open, and then, without closing the menu or choosing another item by accident, move the pointer back over the sprite. Rows or columns of pixels will be inverted as you move the pointer, and the highlighted selection will be deleted as soon as you press <Return> or click on the image. When using the mouse in this way, it is possible to delete in any direction; such as deleting rows from top to bottom, which is not possible when just entering numbers.

Please send in your hints and tips on using Paint, The Big Picture, Revelation, ProArtisan, Studio 24, Photodesk and, indeed, any other relevant bitmap graphics package. Published submissions will receive the magazine disc of their choice.

Just a Page

This month we present Extra Rheolism, an amazing one-line Basic Tetris game by Olly Betts

No, it isn't an April Fool; this is the March issue! The listing below really does produce a fully working Tetris game in just one line of Basic. Based on an earlier one-line game called *Rheolism* by David Moore and Martin Hollis, Olly Betts' enhanced version features colourful pieces, scoring, left, right, rotate and drop keyboard controls and editable speed.

Entering the listing

Extra Rheolism cheats slightly in that its single line is too long to be entered in Basic. Instead, it has to be entered as several lines and a special trick performed to merge the lines into one. The resulting line is 254 bytes long, one byte short of the maximum possible length.

To enter the listing, use *Edit* to create a Command file: choose *Create>Command* from the icon bar menu, and a new window will open. Type in the listing below *extremely* carefully; every character (including spaces) is important, so make sure you get it exactly right! Save the file to disc (the save window should show an *E** icon for a Command file, with the filename *ExecFile*) and double-click on it to load it into Basic. You can now enter *LIST* to see the single-line program, or *RUN* to start the game.

Playing the game

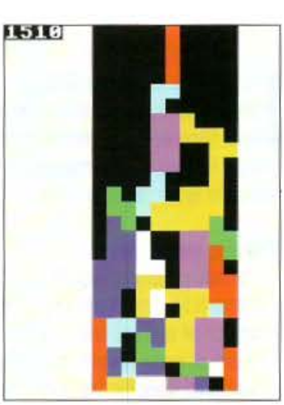
The aim of Tetris is, of course, to manipulate the falling pieces so that they form complete rows at the bottom of the play area. Once a row is complete and contains no gaps, it vanishes. The game ends when the play area has filled up to the top.

Extra Rheolism features multiple key-sets, but the easiest keys to use are the following:

```
Keypad 4: move piece left
Keypad 6: move piece right
Keypad 5: rotate piece
Shift: drop piece to the bottom
```

Scoring is based on how far a piece falls; the closer to the bottom it gets, the higher the score. If you find the game too fast, the speed can be altered by editing the number 6 in line 4; the higher the number, the slower the game, with a value of 99 being the highest allowed.

Because this program is an exercise in what can be achieved in one line, it obviously has a few limitations:-



1. The program requires a monitor capable of displaying mode 9. If, after double-clicking on the file, the number 9 does not appear at the top of the screen the program will not work.

2. Pressing keys other than 4,5,6 or Shift will crash the program.

3. The end of the game is announced by "Mistake".

```
*BASIC
0MODE9:OFF:GCOL-9:CLG:REPEATs=s+VPOS:PRINTCHR$30s:
1REPEATSYS6,135TOi,p,d:PRINTTAB(p=0)CHR$9;:
2IF POS=22 VDU3100;VPOS,21;6667;:UNTIL0 ELSE UNTILVPOS=25:
3v=ABSRND MOD7:VDU31:COLOUR3:
4REPEATm=9-INKEY(INKEYTRUE OR 6)MOD3:
5FORr=TRUE TO1:t=r ANDSGNt:
6IFt=r COLOURv-15:VDUr EORm:i+=m=7AND9-6*r:IF0ELSE
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9IFr VDUp,8:IF0ELSE
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```

Just a Page Competition

Can you come up with a short but impressive listing for publication on this page? We're not expecting further one-line miracles like Extra Rheolism, but it's possible to achieve a surprising amount in only a few lines. Send in your short but ingenious games, interactive graphical demonstrations or utilities; anything is acceptable provided that it's both short and interesting. We will publish the best programs, and our favourite will also win a year's magazine and disc subscription. In addition, we will give a free magazine disc of your choice for all published entries. Submissions should be accompanied by a brief piece of text explaining what the program does and how it works. The winner will be chosen on 30th April.

Send entries to the BEEBUG office.

Compiler Corner

A regular look at the world of C and C++ by Thomas Down

In the first Compiler Corner column, I looked at the importance of handling errors carefully in C programs, and showed how simple functions could be written to check for errors returned by functions, and display suitable error reports.

Taking exception

When programming in C++, a rather more powerful approach to error handling is possible, based on the concept of exceptions. These are closer to Basic's system of error handling, in that execution can be made to jump to specific locations within the program when errors occur. The C++ exception system is based on *try* and *catch* blocks, which are arranged together as follows:

```
try {
// Code which could produce an error.
// ...
}
catch(MyException)
{
  // This code is executed when MyException occurs.
}
catch(FileErr e)
{
  // Alternative error handler.
}
```

Each type of exception which could occur within a program must have a corresponding class declared. This class may be totally empty, for example:

```
class MyException;
```

Anywhere within a *try* block, it is possible to generate an exception using the *throw* command. *Throw* takes an object as a parameter. In simple cases, that object is normally created 'in situ' by simply calling the relevant constructor, for example:

```
throw MyException();
```

When an exception is thrown, the run-time system checks the *catch* blocks which follow the current *try* block. If a catch block exists for the type of object that has been thrown, the code in that catch block is called. Normally, this code would report an error, then either quit the program, or, in the case of a non-fatal error, tidy up any 'loose ends' left by the failed code in the try block, before continuing with normal program execution.

So far, we have not done anything which was not already possible, albeit less neatly, using normal C constructs such as *if* statements. So what makes exceptions so special? The most obvious benefit is that they work across function calls. The *throw* command can be issued directly in a *try* block, but it can also be used in any function called within the block. In fact, however many nested function calls have occurred since the *try* statement, the C++ run-time system should always be able to trace execution back down the stack to find the relevant *catch* block. This provides an extremely neat solution to error handling in library functions. In C Wimp libraries, most functions return a pointer to an error block, which must be explicitly checked to see if an error needs reporting. C++ library functions, on the other hand, can simply throw an exception when an error occurs, and expect the calling program to catch it and deal with it sensibly.

In the simplest cases, exceptions can simply be 'empty' classes. Here, the only information that the *catch* block receives is the fact that the exception has been thrown. However, you can pass extra information to the *catch* block by defining members of the exception class. You could then pass some parameters to the exception class' constructor, for example:

```
throw FileErr(FileErr::err_DISCFULL);
```

In this case, you should define the catch block like the second block in the example above; the object e is defined within the catch block, and its members could be accessed to find out what error has occurred. You could, for example, then define a report method in the FileErr class, then, in the catch block, use `e.report()` to pop up an error box with an appropriate message.

The other advantage of exceptions over other methods of error handling is that when an exception is thrown, the run-time system tries to abort any operations which have been performed in the *try* block. It does this by calling the destructors of all objects which have been created since the start of the block. Not only does this prevent wastage of memory when errors occur, but it can also avoid other side-effects of an operation being aborted mid-way. If, for example, a save routine is using some filing class to write the data to disc, and an exception occurs, the destructor for the file object will be called, which should result in the file being closed.

The only bad news concerning exceptions is that they are not available in all compilers. They have only been added to the C++ standard comparatively recently, and many compiler developers have still not implemented them. This is at least partially understandable, since implementing exceptions well in a compiled language is not an easy task. Currently, the only RISC OS compiler with exception support is Easy C++. The situation may, however, improve in the future. ARM Ltd is working on a true C++ compiler (the system supplied with Acorn C/C++ is only a translator) which may support exceptions. Also, the more recent versions of the GNU C/C++ compiler support exceptions. Hopefully, an up-to-date version will be available for RISC OS shortly.

Strcpy and array bounds

It is often easy to forget that C, and indeed C++, imposes no bound-checking on simple arrays. In Basic, you can expect code like:

```
DIM myarray%(5)
i%=0
REPEAT
  INPUT "Number:"n%
  myarray%(i%)=n%:i%+=1
UNTIL n%=0
```

to fail with a meaningful error message if the user enters more than six numbers. However, closely analogous code written in C would not report any error, since `myarray[i]` is simply an alternative way of writing `*(myarray+i)`, and it is possible for pointer operations to access any part of memory which is not protected by the computer's memory controller. Thus, when an array subscript runs off the end of an array, it will simply overwrite any variables which follow the array in question in memory. In extreme cases, almost any part of the computer's memory map could be affected.

It is particularly easy to run over the end of arrays when dealing with strings. Always remember that, in C, a string is just an array of bytes. A simple function such as:

```
void My_String_Function(char *s)
{
  char s2[50] ;
  int myvar=6;

  strcpy(s2,s);

  /* Some processing */
}
```

can easily corrupt memory if it is called with a pointer to a string longer than 50 characters, usually resulting in the corruption of *myvar*. In cases like this, the easiest way to avoid this problem is to replace the call to *strcpy* with *strncpy*. This allows an absolute limit to be imposed on how many characters are copied. In the example above, replacing `strcpy(s2,s);` with `strncpy(s2,s,sizeof(s2));` will ensure that no characters are copied after the end of the array *s2*, avoiding corruption. However, this technique also has its problems: important data may be lost from the end of a string, and the program could still fail, although for different reasons. Where no upper limit on the length of a string is known, or the upper limit is much larger than the 'typical' length, an alternative version of *My_String_Function* should be used, for example:

```
void My_String_Function(char *s);
{
  char *s2=malloc(strlen(s)+1) ;
  if(s2==NULL)
  {
    /* Error */
  }
  strcpy(s2,s);
  /* ... */
  free(s2);
}
```

Note that one extra byte of memory is allocated, over and above the length given by *strlen*. This is because strlen does not allow for the NULL termination byte needed at the end of a string.

An alternative approach to this problem, when working in C++, is to use a class which handles a string intelligently, allocating memory automatically as needed. Such a class will be introduced in next month's column.

HyperStudio

Helen Melhuish examines an important cross-platform multimedia authoring tool

"What exactly is Hyperstudio?" I read in an Acorn newsgroup the other day. The benevolent respondent pointed the enquirer straight to the HyperStudio website (`http://www.hyperstudio. com`) where they would find information on mailing lists, education user groups and the like, all clearly associated with a well-established program. One may be forgiven for being slightly suspicious of a program that has been ported from another platform (the Mac, in this instance) but there are no such worries in the case of HyperStudio. The recently-released Windows and Acorn versions have been written from scratch, with the Acorn version in particular retaining, and even building on, the functionality of the Mac version.

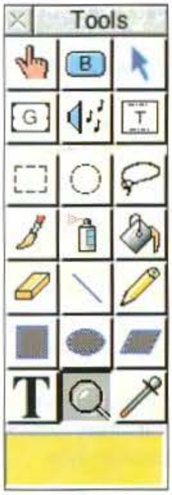
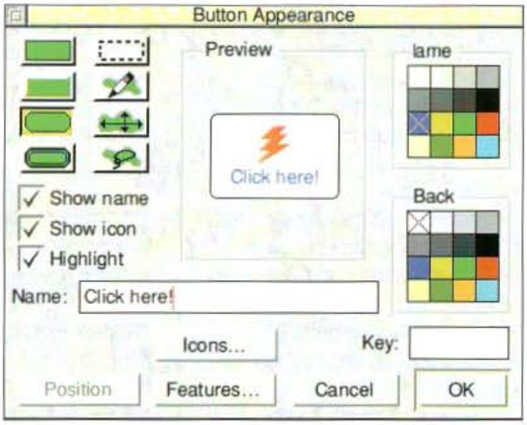


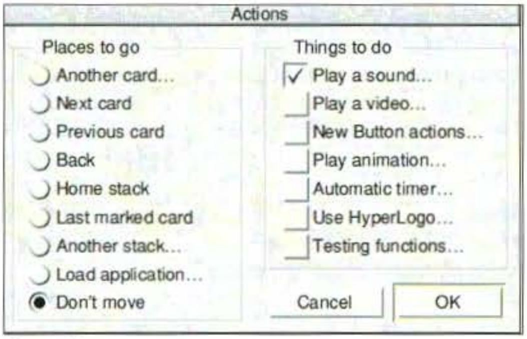
Figure 1.
Tools for everything.



☑ Show name
☑ Show icon
☑ Highlight
Name: Click here!

Preview: Click here!

Figure 2.
Setting button attributes is easy...



Places to go:
○ Another card...
○ Next card
○ Previous card
○ Back
○ Home stack
○ Last marked card
○ Another stack...
○ Load application...
● Don't move

Things to do:
☑ Play a sound...
☐ Play a video...
☐ New Button actions...
☐ Play animation...
☐ Automatic timer...
☐ Use HyperLogo...
☐ Testing functions...

Figure 3.
...and setting button actions is flexible.

More multimedia?

So what place can another multimedia program have in the Acorn scene, particularly the education marketplace? The tried and tested programs like *Genesis*, *Magpie* and, more recently, *Ultima* have their loyal following. Ultima, in particular, has an interface that makes it accessible to a wide range of learners which, I think, is hard to beat when considering the very young, inexperienced learners or those with special needs. HyperStudio is also a tried and tested program, and should be seen as a very welcome addition to the Acorn platform.

So what's it like to use?

The pages of a HyperStudio presentation are referred to as cards, and a series of cards is known as a stack (an application in reality). Any card can be linked to any other card in any other stack. In other words, it is totally flexible for linear, circular and branching presentations, and is perfect for modular projects. Imagine every child in a class creating their own stack, each of these being linked by a 'front-end' stack.

For immediate creation of graphics onto a card, HyperStudio has drawing and painting tools built in (see figure 1). There is a selection of brush shapes to choose from: a spray can, freehand tool, line tool, a colour picker, an eraser, a fill tool, three shapes tools and a text tool. The text tool allows text to be 'painted' onto the background; fundamentally different from a text area, which requires the correct fonts to be available. There are three tools for selecting areas of the card: rectangular, elliptical and lasso. Selected areas can be cut, copied, pasted, scaled, rotated and flipped as a bitmap. These tools will provide some children with the direct access they need without having to be concerned with graphics files from other sources.

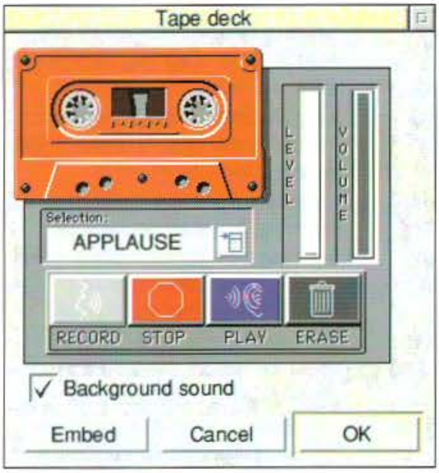
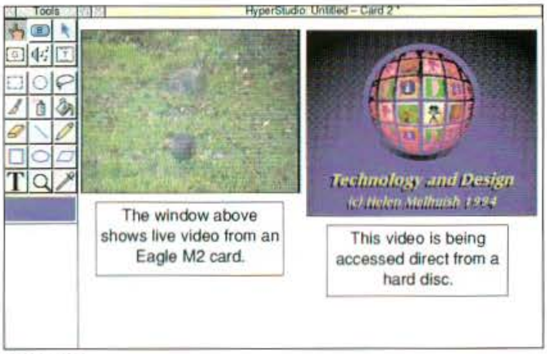


Figure 4.
Sounds are added with the tape deck, though direct recording is not yet supported.

Any card can contain graphics, text and buttons. When a graphic file is dragged onto a card, you are asked what role you want it to play. It can be one of three things: a background, which can be shared between cards; clip-art, which is fixed to the background but can be cut, copied and pasted as a bitmap; or a graphic object, which 'floats' above the background, and can be movable and given a name. At the moment, HyperStudio can accept Draw files, sprites and ArtWorks files. Text can be displayed in any colour, font, size or style. Text areas can be made editable, scrollable or read-only.

The way in which HyperStudio uses buttons is one of the tidiest I've seen (see figure 2). Simply add a button from a selection of eight types and decide its position on the card. You are then asked what you want that button to do. Options range from playing a sound, video clip or animation to navigating to another card or stack. Once defined, the attributes of graphics, text areas and buttons can be edited by double-clicking on the object you wish to change (see figure 3). OLE support has been included so that graphics can be edited in detail straight from a HyperStudio card.

The button types available are quite comprehensive. There is the plain rectangle, the invisible rectangle, the drop-shadow rectangle, the invisible irregular shape, the rounded rectangle, the expanding area button (imagine using a fill tool in a painting program; the area it fills becomes the button), the button that is activated by hitting the <Return> key and the lasso button (opposite to the expanding button). Buttons can show the button name, highlight when activated and display an icon. There is a set of default button icons provided, but others can be created from your own sprites.



The window above shows live video from an Eagle M2 card.

This video is being accessed direct from a hard disc.

Figure 5.
Live video can come from a variety of sources.

So, it's a functional painting package, it accepts different graphic file formats, cards can be linked together quickly and easily... what about the *really* juicy bits?

More advanced features

Buttons can be used to activate sounds. These sounds can be made to play in the background, which in effect means two sounds can be playing at once: one in the background and one in the foreground. Direct sound recording into HyperStudio is not yet supported, but it is easy enough to drag a sound file into the *Tape deck* window (see figure 4). The formats currently supported are .WAV, Armadeus, Module, AudioWorks and Acorn Replay sounds.

Buttons can also activate video clips. Dragging a video clip onto a card allows features to be set up such as erasing the clip when it has finished playing, and so on. One particularly clever feature is that a video window can be defined for displaying live video from an Eagle M2 card (see figure 5). This could add a uniquely 'live' aspect to a HyperStudio stack. Clip-art can also be grabbed from Eagle M2 input. Buttons can also activate New Button Actions (NBAs). These are a bit like modules that can be embedded in a stack if required. An example NBA is the *Button*

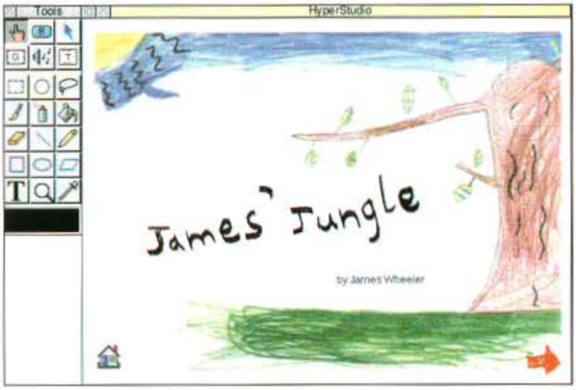


Figure 6.
James' Jungle, one of the supplied example projects.

Runner. This allows one button to trigger off any other buttons whose names are typed into a list. Other NBAs provided include *HideShow*, for hiding or showing named graphic objects, *CDPlayer* for interacting with audio CDs, and *TextMover*, which allows text to be moved from one text area to another. The Mac version of HyperStudio comes with considerably more NBAs, but hopefully most of these will be transported to the Acorn version soon.

Hyperstudio can also handle animations. It can import a series of sprites with consecutive numbers from the same directory and display them sequentially. Alternatively, using the *Save screen* option from the menu allows separate 'cells' to be created on the card and saved out in number order, then re-imported. There is an option to change the speed of the animation, but unfortunately no way to specify the exact frame rate. Another button action is the automatic timer. This allows buttons to be activated automatically after a number of seconds, either when the card is shown or repeating at regular intervals. This could be used to great effect with small animations in a story scene to give the card a bit more activity, or to create a carousel or slide show presentation.

There is also a testing function built in. A button can be defined as producing a correct answer, an incorrect answer or no answer at all. The answers are recorded in a *test* file that is saved to the same directory as the stack. Apart from the obvious uses for multiple-choice tests, this feature might also be used for gathering information in surveys.

The last button action I will mention is the one which allows the use of *HyperLogo*, HyperStudio's built-in script language. For most purposes this is an unnecessary complication, but it does provide another level of flexibility which may be required for more sophisticated presentations. Unfortunately, for this review I was not provided with a HyperLogo reference manual, but if the language is anything like the HyperLogo built into the Mac and Windows versions (which it surely is), it is quite straightforward, but probably not for those totally new to using scripts. Although it uses the word *Logo* in its title and it uses procedures, it does far more than draw turtle graphics on a card. It can be used to manipulate text fields, buttons and graphic objects on any card in a stack, whether they are being displayed at the time or not. A short HyperLogo script, to put the text "I love writing scripts" into a text area called *display*, might be:

```
SETFIELDTEXT "display "I\ love\ writing\ scripts.
```

Other clever things

HyperStudio is a CD-ROM product which requires at least RISC OS 3.1 and 2Mb, or preferably 4Mb, of RAM. It can, however, be installed from floppy discs, which will be provided by TAG on request. The CD does not just hold the program, but also a considerable number of goodies. There are ten example projects to look at, my favourite of which has to be *James' Jungle* by James Wheeler (see figure 6). There are also sample cards to use, seven sets of sprites for use in animations, and plenty of sounds, pictures and photographs, all of which present a very usable and comprehensive resource. Also provided is a run-time version of the program, HSPlayer, which is freely distributable for non-profit making purposes, allowing stacks to be viewed without needing the full program.

On top of all this, HyperStudio stacks are also transportable between platforms. That means that if you have developed stacks on a Mac or PC, you can also view them on your Acorn. To do this you need the full Acorn version of HyperStudio, not just HSPlayer. There is a utility in development which will allow conversion the other way round (i.e. Acorn to Mac/Windows); I for one hope it will be ready very soon! There are some limitations concerning filetypes, filename lengths and fonts, but this is only to be expected. I also hope that more NBAs are in development, along with direct sound recording. There are also special licensing arrangements available that provide 'home' versions of HyperStudio so that children can carry stacks with them between home and school. Details are also included in the HyperStudio pack of an organisation called *HyperStudio Users in Education*. To members it provides a network of information, ideas and consultancy, and has direct links with the Interactive Multimedia in Education team at TERU, Goldsmiths, University of London. The example stacks on the CD called *Renuables* is a demonstration from a CD-ROM developed by this team. All of this should increase confidence in an already well-established program, along with the fact that HyperStudio recently won a well-deserved Gold award at BETT.

HyperStudio

Supplier	TAG Developments Ltd 25 Pelham Road Gravesend Kent DA11 OHU Tel. 01474 357350 Fax 01474 537887
Email	info@tagdev.co.uk
Price	£99.95 ex. VAT

(Special offer: £79.95 ex. VAT until the end of March)

Conclusion

So, hearty congratulations to TAG Developments and those involved in bringing HyperStudio to the Acorn platform. If ever there was a program that deserved support to encourage its continued development, not least because of the creative possibilities it opens up to children, HyperStudio is it.

RISC User Puzzle

Win a magazine and disc subscription with our regular puzzle feature.
Puzzle designed by Roger King

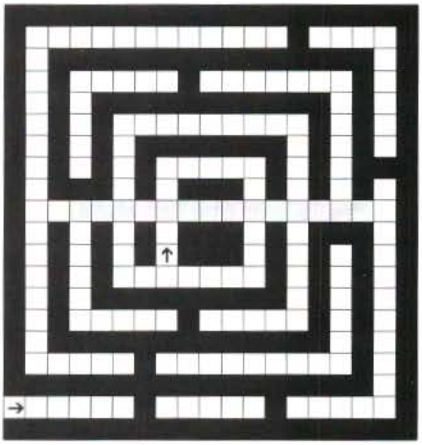
To enter, send a copy of the completed puzzle to the Beebug offices in an envelope marked 'Puzzle', together with your name, address and membership number. The magazine disc contains the puzzle as a Draw file, and we suggest that you use Draw to complete the puzzle on the screen, then print out and send us your solution. The closing date is 8th April.

In a Whirl

Starting at the arrow pointing to the right, enter your solutions into the grid in an anticlockwise direction until you reach the end of the grid which is shown by an upwards-pointing arrow. They greyed-out squares should lead you to a famous Charles Dickens character which you must fill in.

Clues

Our computer choice (5) A threat to our computers (5) A picture puzzle (5) Common storage media (6,5) A calculator (6) Syrian cloth for a pop group (4) Computer memory (6,6) Our favourite reading matter (4,4,8) Popular printer manufacturer (5) BASIC or PASCAL for instance (9) Just the things for cold winter nights (6) Brother or sister (7) Definitely needed with complex software (7) We would have no hard copy without it (5) One fitted to car or piano (5) My spelling checker offers bedbug for this word! (6) Aims achieved by footballers (5) Vital part of high definition printer (5) It makes a good cup of coffee (10) Software for restraining your rodent (9) Salts (8) A slice or portion (7) Get a telling-off for going into space! (6) Chief Tory (5) There is one at Hampton Court (4)



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The winner of the December/January puzzle is **K.J. Dronfield (solution on page 62)**

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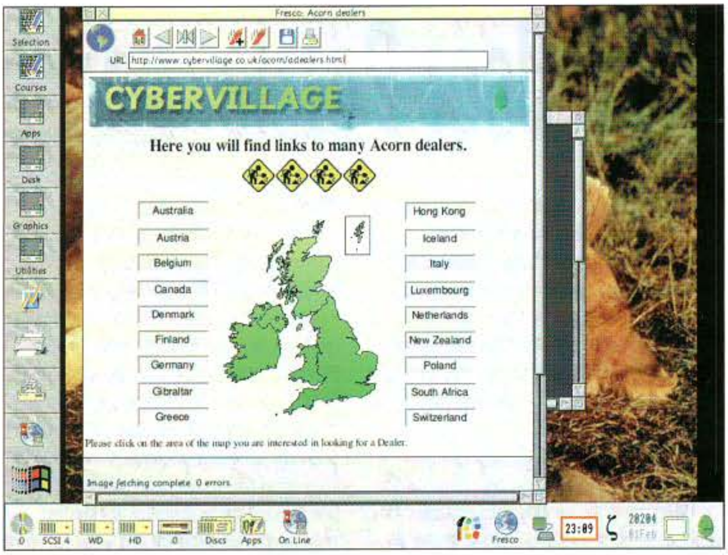
Netline

Robin Watts finds out how to establish a personal presence on the World Wide Web



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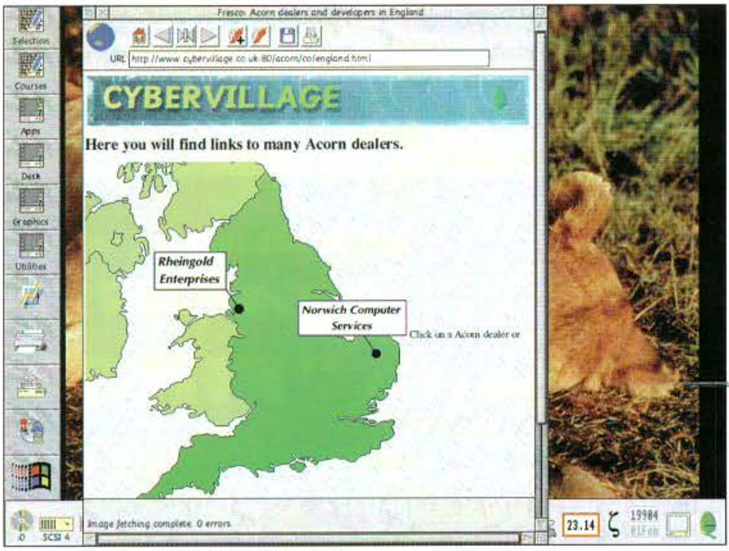
Please click on the area of the map you are interested in looking for a Dealer.

Image fetching complete. 0 errors.

Click on your home in the map...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URL http://www.cybervillage.co.uk:80/acorn/co/england.html
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...and see where your local dealers are

Several months ago I talked about the World Wide Web, what it was, and how it worked. In the article I said that unless you were lucky enough to have a permanent connection to the Internet, the only way to publish pages on the web was to buy expensive web space from a service provider. Now the situation has changed somewhat.

Quantum Software has teamed up with Rheingold Enterprises (run by our ex-Editor and ex-Netliner, Alan Wrigley), to provide a service to businesses. Launched at the Acorn World '95 show, the Acorn Cybervillage is designed to allow Acorn-based dealers and developers to tap into the huge advertising potential of the Internet for much more modest sums than might otherwise be the case.

To attract people to read the pages, useful information and links are being collated together, along with the latest news and gossip from the Acorn scene. There is demonstration software to download and information on new releases.

One very slick feature is the ability to click on a map of the UK and zoom in to see where your local dealers are. At the time of writing, it must be said that the map is pretty sparse, but with a succession of new dealers looking to sign up in the near future, hopefully that situation will have improved by the time you read this.

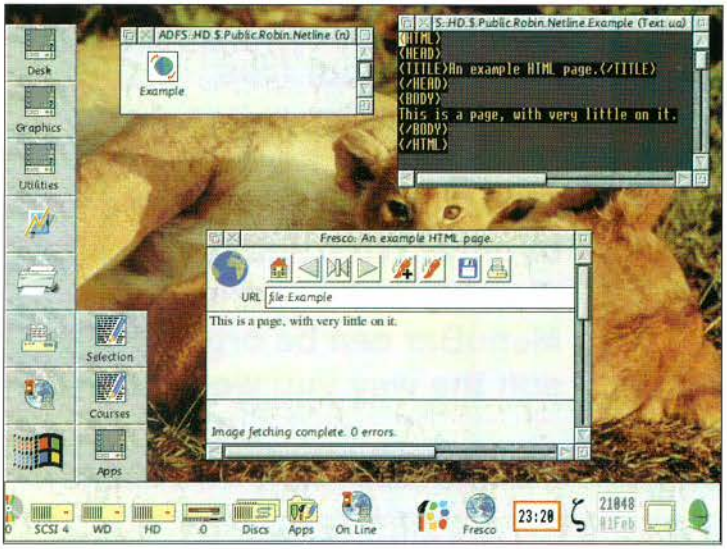
Companies can buy space on the site from as little as five pounds a month, or a classified listing can be had for just fifteen pounds a year; peanuts when you consider that a tiny advert in the back of a computer magazine with a shelf-life of less than a month costs around seventy pounds.

While I have no hard figures as yet for pricings for individual users, I am informed that prices will be around half that of other service providers. With prices like these, it seems an ideal way for shareware authors to tout their wares; users can read about your software and be just one click away from downloading it to try it out.

Mindful of Acorn's strong base in education, the village has plans for a *SchoolWeb* section where schools can rent space for pupils to create and publish pages. It is easy to imagine this section becoming very popular, and promoting the idea of schools from different areas of the country working together on projects, sharing information across the Internet.

Finally, Stuart Halliday, the Webmaster, informs me that the site is running at over 1000 *hits* a month, and they are being considered for the Top 5% Web site award. It is nice to see an Acorn-based venture succeeding in the wider world.

The Acorn Cybervillage can be found by pointing your web browser at:



```
S:HD.$.Public.Robin.Netline.Example (Text ua)
<HTML>
<HEAD>
<TITLE>An example HTML page.</TITLE>
</HEAD>
<BODY>
This is a page, with very little on it.
</BODY>
</HTML>
```

Fresco: An example HTML page

URL file:Example

This is a page, with very little on it.

Image fetching complete. 0 errors.

Using our example to create a web page

```
http://www.cybervillage.co.uk/acorn/
```

and more details of tariffs can be had by emailing Stuart Halliday at:

```
stuart@quantumsoft.co.uk
```

Designing your own pages

For those of you who would like to try your hand at creating some pages for the web, but don't want to spend any money on it, there is a solution. Every web browser application allows you to load pages from your hard disc, rather than across the web. This means that you can have a go at creating your own little piece of cyberspace within the safe confines of your hard disc.

All you need is a web browser and your favourite text editor. Commercial browsers are available from ANT, Doggysoft and others as part of full Internet suites, but there are perfectly respectable freeware ones around, such as *ArcWeb* and *Webster*. These are available to download from the Internet, or from any good PD library.

Creating pages is done by producing HTML files. HTML stands for HyperText Markup Language, and is basically text interspersed with annotations in angle brackets. These annotations are instructions for your browser; they dictate how the page is laid out, what graphics are included in the picture, and, most importantly, they define links from one page to another.

Explaining all of HTML would take far more space than is available, so over the next few months, I intend to dedicate part of each column to explaining it bit by bit.

A simple example of an HTML file is as follows:

```
<HTML>
<HEAD>
<TITLE>An example HTML page</TITLE>
</HEAD>
<BODY>
This is a page with very little on it.
</BODY>
</HTML>
```

Type this into your favourite editor, and save it to your hard disc as *Example*. To view it in your browser, tell the browser to fetch:

```
file:ADFS::HardDisc.$.WWW.Example
```

(modifying the pathname as appropriate, of course). All being well, you should see the page displayed before you.

If there looks to be an awful lot of text for very little effect, don't lose heart; expanding the page from this simple start is extremely easy.

The first command, `<HTML>`, tells the browser that it is dealing with an HTML file. Files without this in will probably work on most browsers anyway, as they are designed to be as forgiving as possible, but you shouldn't rely on browsers understanding everything you put down. For this reason, if you do publish your pages it is worth checking their appearance with several browsers, rather than just one. Your browser may be silently accepting a flaw that trips another one up.

The next command, `<HEAD>`, introduces the header of the document. This area is designed for you to set things like the title of the page in, and the `<TITLE>` command does exactly that. Here you get your first experience of a structure you will see again and again in HTML: features are turned on with a command, and then turned off again with the same command preceded by a '/'. The title of this page is therefore *An example HTML page*.

The `</HEAD>` command closes the header section, and `<BODY>`, logically enough, introduces the main body of the text. The text to be displayed on the page goes in here, and `</BODY>` and `</HTML>` close the document.

Next month I will tell you how to add graphics and links to your page to improve both its appearance and its interactivity. For those of you for whom this is all too much work anyway, I'll also take a look at ways of publishing Web pages without all this grind by using some web page creation tools.

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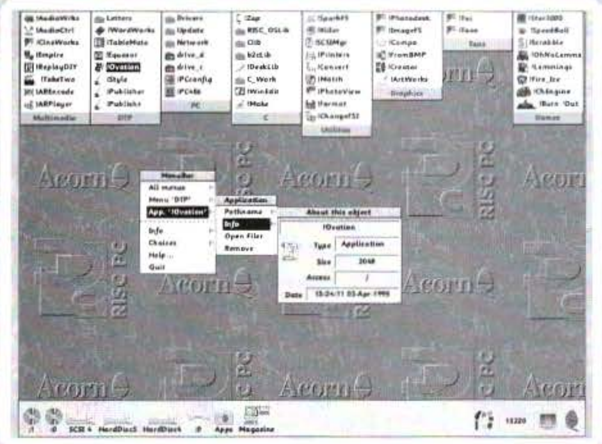

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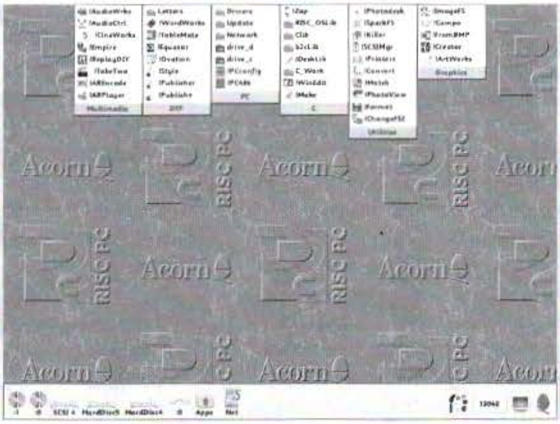

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Q

Loading text files by indirect means

I am writing a program which I wish to be compatible with all versions of RISC OS. I have provided a Help option on a menu and, when chosen, this should cause a text file within the program's application directory to be loaded into whatever text editor is currently available. Currently my program simply 'runs' the help file, but if Edit is already loaded, another copy is installed. How can I stop this happening?

Alexander Gibbs

A This is one particular instance of a more general problem. What you are trying to do is, in effect, to duplicate the behaviour of the Filer, in the form of getting your program to 'double-click' on a file. Obviously the desired result should be the same as the user physically double-clicking; but there is no easy way to achieve this by use of simulated icon clicks, for instance, as you can't obtain window and icon handles for a Filer window and simulate a double-click on them by use of *Mouse_Click* Wimp messages. Indeed, you would almost certainly be wanting to 'double-click' a file for which there is no Filer window open anyway.

The obvious solution is to provide a simple command to run the file, such as:

```
    Run <App$Dir>.Docs.ReadMe
```

This is, of course, what you have tried already. Depending on the text editor you have installed, running this may either launch another copy of the editor or simply result in an error message being displayed (the freeware editor *Zap*, for instance, will not install multiple copies of itself). This particular problem can be solved by using *Filer_Run* instead of the simple *Run*:

```
    Filer_Run <App$Dir>.Docs.ReadMe
```

This does, in fact, simulate exactly what you want. Unfortunately, if you use it, your program would not work properly with RISC OS 2, since Filer_Run was an addition of RISC OS 3.

A more universal solution lies in the following Basic program fragment, which illustrates the basic principle of what you need to do. You could, in fact, make this program a !Help file in its own right by substituting *Obey$Dir* for *App$Dir* and using it to load one or more files from within an application when Help is chosen from the Filer menu.

The approach needed is to transmit a load request for a file by using the *Message_DataOpen (5)* Wimp message. This message is normally used by the Filer itself for the same purpose when the user actually double-clicks on a file to load it.

```
    DIM Block 256, vloc 256, buffer 256
    SYS "Wimp_Initialise",200,&4B534154,
"Transient Program" TO ,Task
    Block!0=256:Block!12=0:Block!16=5
    Block!24=0:Block!28=0:Block!32=0:
Block!36=0
    Block!40=&FFF
    $vloc="App$Dir":SYS "OS_ReadVarVal",
vloc,buffer,256,,3 TO ,,n
    ?(buffer+n)=13
    $(Block+44)=$buffer+".Docs.ReadMe"+
CHR$0
    SYS "Wimp_SendMessage",17,Block,0
    SYS "Wimp_CloseDown",Task,&4B534154
```

The value of *App$Dir* (which must be set for your application) is read, and the program causes the *ReadMe* file in the *Docs* subdirectory to be loaded into whatever text editor happens to be running.

The only potential problem with the above program is that it doesn't work if no text editor is loaded. When the Filer uses this message, it expects to receive an immediate acknowledgement from whatever program is set up to load the particular type of file that has just been double-clicked, to confirm that the file in question has indeed been loaded. This takes the form of a *Message_LoadDataAck (4)* message. If this is not immediately forthcoming, the Filer will *RUN the file, causing the appropriate editor to be installed.

To cater for all circumstances, therefore, if you use the above technique in a program, you should also follow the Filer's behaviour. Set a flag to indicate that you have sent the *Message_DataOpen* message, and if you do not receive an acknowledgement, assume that the file has not been loaded and *RUN it. This will cause an editor to be installed and run the file.

Richard Hallas

Q

Plotting a course

I have recently acquired a Watanabe flatbed plotter, which I hope to use for printed circuit design. I should be grateful for any advice on where I may obtain a plotter driver for an A5000 using RISC OS 3.1.

J. Lee

A Assuming your plotter is HPGL-compatible, a suitable driver, DrawPlot, is available from Oak Solutions. Their address is:

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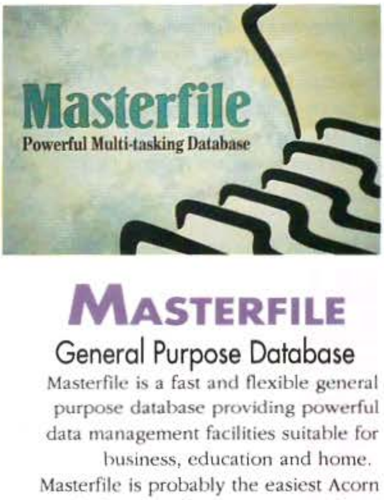

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Puzzle Solution Dec/Jan 1996

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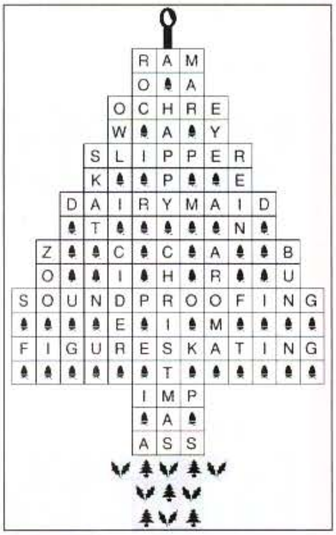

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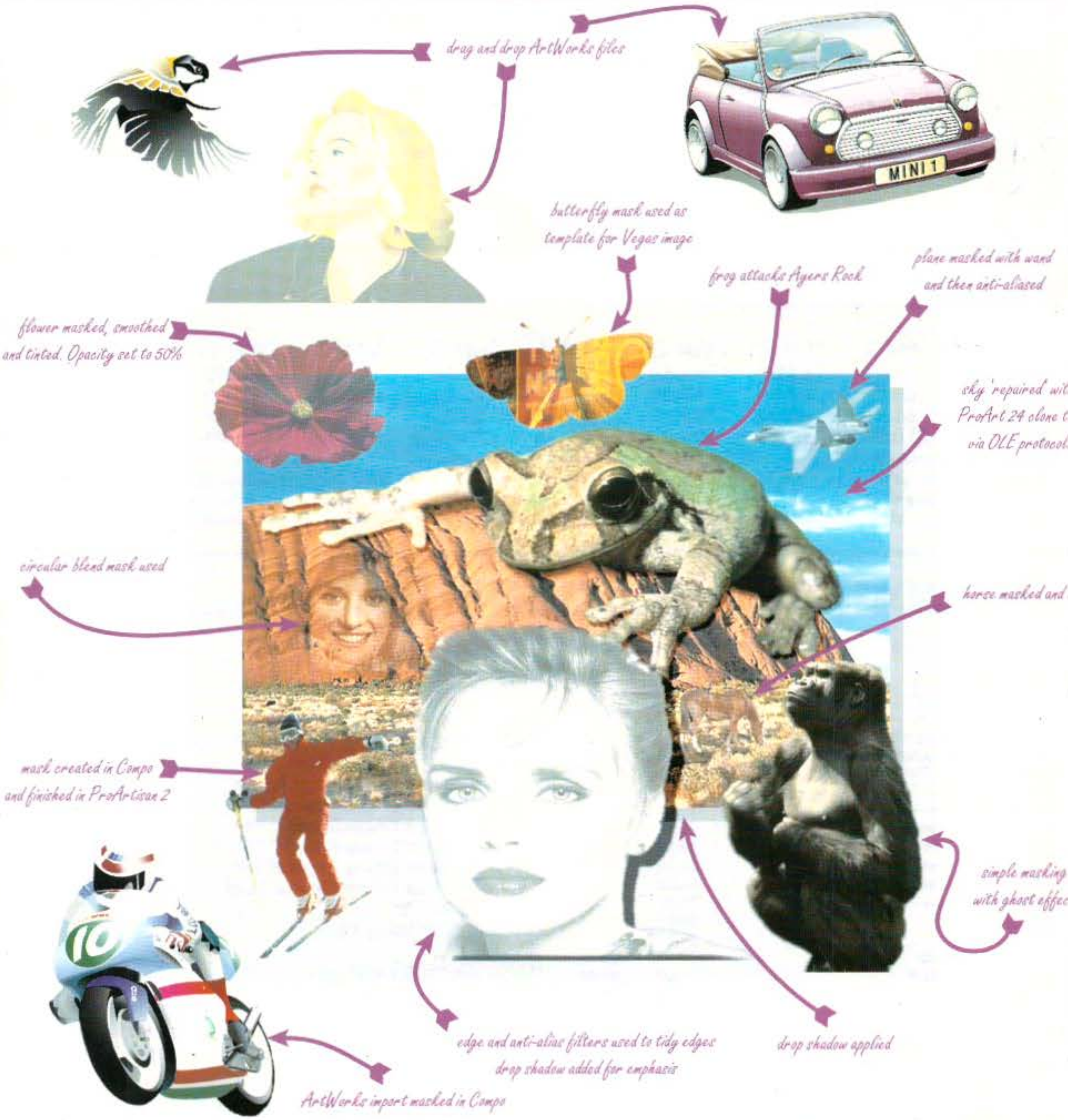
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